CLINICAL IMPLEMENTATION OF SUICIDE RISK ALGORITHM

Specific Aim – We propose to conduct a qualitative study to explore clinicians’ and patients’ questions, concerns, and suggestions regarding the use of a suicide risk prediction algorithm in clinical care.

Background – Algorithms derived from machine learning are increasingly being used to predict health risks and drive clinical care, but how these tools will be implemented in everyday clinical practice at the point of patient care, and the human factors that influence their use, remain understudied. The MHRN-developed suicide risk prediction algorithm can accurately identify persons who are at risk for suicide attempt and suicide death, outperforming other similar suicide risk prediction algorithms. The risk calculator has gained attention from health care leaders at several MHRN-affiliated sites (e.g., KPNW, KPW, Health Partners) who are currently considering its implementation in their health systems. While these kinds of tools add another arrow in the quiver of suicide prevention, there are concerns about how they would be integrated into clinical workflows, what liabilities and responsibilities they introduce, how they might influence patient visits, risk communication and decision making, the doctor-patient relationship, and other clinical interventions. The potential benefits of these approaches to care are dependent on making sure that these kinds of tools are deployed in a manner that does not harm patients, that supports clinical care management, and that is sustainable for health systems.

Preliminary Studies – The proposed work will build on several areas of existing MHRN infrastructure and investigator expertise, including:

* A well-characterized data infrastructure across all sites, including harmonized representation of member demographics, outpatient and inpatient health service use, prescription medication orders and fills, and patient reported outcomes (including measures of depression severity and suicidal ideation)
* Methods and tools for ascertaining suicidal ideation, non-fatal suicide attempts, and suicide deaths
* Machine-learning derived models for accurately predicting short-term risk of suicidal behavior
* Expertise in qualitative methods, and in particular in qualitative work related to very vulnerable patients with psychiatric conditions

Design and Methods – Using data from 3 MHRN health systems, we propose to conduct qualitative interviews with:

* Key-informants who have developed/deployed suicide risk prediction tools in other health systems (e.g., VA), and with health care leaders in MHRN-affiliated health systems who are currently considering implementation of the MHRN’s suicide risk calculator (n=10)
* Clinicians (n=45)
* Patients (n=30)

Innovation and Impact – This work will provide important guidance to health systems considering use of machine-learning derived prediction scores. This work builds on essential data infrastructure and analytic methods developed in previous MHRN research. This work will both support and benefit from the parallel development of the proposed new MHRN Methods Core.

Lead Investigator – Bobbi Jo Yarborough/Frances Lynch

Sites Interested –KPCO, KPHI, Geisinger, HealthPartners, KPNW, PAMFRI, HFHS, KPW

Work Plan: KPNW will be the lead site:

* KPNW will develop interview guides for key informant, clinician, and patient interviews.
* KPNW will conduct key informant interviews. The interview guide will explore how existing suicide risk algorithms have been implemented in various settings (e.g., VA); how they have influenced workflows, patient visits, outcomes; logistical and operational learnings; clinician and organizational value of these tools and perceived patient value. Clinician and patient interview guides under development during key informant interviews will be revised as needed based on key informant interview findings.
* Each site will identify and recruit 15 clinicians to participate in a 15-30 minute clinician interview. How the risk calculator will be implemented in different health systems is currently unknown. If we learn that the tool will be visible to all clinicians in a given system then we will recruit from various departments (e.g., primary care, specialty mental health, emergency). However, it is more likely that a pilot implementation of this tool would be limited to mental health specialty care and thus we would limit recruitment accordingly. The interview guide will explore value of risk prediction tools generally, and a suicide risk prediction tool specifically; how these tools should be implemented (in the electronic health record (EHR) and in the patient visit) from clinician point of view; situations that would cause clinician to act upon versus ignore a risk score (e.g., EHR-based alert fatigue); etc.
* KPNW will develop a distributed program to identify patients for interviews. It will be important to try to identify a representative sample of higher risk patients, including those for whom traditional risk factors (e.g., previous suicide attempts, high PHQ-9 item 9 response) are not apparent and who might be surprised to learn they are identified as high risk.
* Each site will identify and recruit 10 patients to participate in patient interviews. Interview guide will explore value of risk prediction tools generally, and a suicide risk prediction tool specifically; how these tools might affect the clinical visit and clinician-patient relationship; what information patients want to know about their risk and how it is determined (i.e., do they want to know/see the risk factors that increased their risk, how/why would that make a difference); etc.
* All interviews will be audio-recorded on HIPAA-compliant encrypted recording devices. Sites will transfer interview recordings to KPNW, recordings will be sent to vendor for transcription, transcripts will be returned to KPNW for coding and analysis.
* Investigators from all sites will participate in interpretation and preparation of manuscripts.

Timeline and budget scheme – Health system leadership at some of the interested MHRN sites have expressed interest in the MHRN suicide risk prediction tool (e.g., KPNW, KPW, Health Partners), some sites are considering pilot implementation. We may have little influence over whether and when these pilot implementation projects will occur. Ideally key informant interviews and at least some of the clinician interviews would precede and could inform the health system led pilot implementation projects, other interviews could be done among clinicians who are part of the pilot implementation projects. Patient interviews might be more informative after patients have experienced a visit where the risk calculator was used, though it may be difficult to identify those patients. Alternatively, this project could be implemented completely independent of health system led pilot implementation projects.

Anticipated total budget (including F&A costs) will be approximately $388,000 for the KPNW lead site (with $5,000 allowance for Dr. Nigam Shah as a consultant) and approximately $96,000 for two other sites – for a total budget of approximately $580,000 across two project budget years.