I7 Advancing Risk Assessment and Risk Management Using Analytics: The Electronic Hamilton Anatomy of Risk Management-Forensic Version (eHARM-FV)

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Learning Overview: This presentation will provide a demonstration of the eHARM-FV aggregator and database functions as well as results from analyzing eHARM-FV-based data with machine learning.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by imparting knowledge about the eHARM aggregator and how eHARM-FV-based data can be analyzed using machine learning.

The eHARM-FV is the first risk assessment strategy to incorporate and use internal analytics and "big data" capabilities and thus introduces the fifth generation of risk assessment. With the capability of the eHARM-FV to store data, an additional tool, the aggregator, was created. The development of the aggregator tool added a significant degree of functionality that heightens the usefulness of the eHARM-FV. By loading multiple eHARM-FV patient files into the tool, the aggregator allows for large-scale analysis at the group level and within moments, trends can be viewed across diagnosis, risk factors, treatments, and interventions. For instance, users can easily identify which programs have the highest number of referrals, greatest involvement, longest waitlists, and least engagement to inform program planning and resource allocation. Moreover, this data may be cross-referenced with aggressive incidents or risk ratings to determine where a need exists for a given program or unit. Thus, the eHARM-FV database can inform risk management, research, service planning, and quality management.

In addition, the aggregator tool allows users to download imported data into a de-identified database that includes each existing eHARM-FV report for each patient selected. The database derived from the eHARM-FV is generated at the clinical interface, avoiding additional data collection or entry and the potential for errors, and increasing the ecological validly of studies that use the eHARM-FV-based data. This function of the aggregator presents a step toward machine learning and big data analysis within forensics as it creates a rich database consisting of an extensive variety of relevant variables at numerous time points, alongside accurate, longitudinal, and historical data about risk, treatment, and outcome variables.

Big data and analytics are rapidly changing health care and enabling a degree of measurement and quality improvement not previously seen. For a variety of reasons, including the limited number of quality indicators in mental health care, psychiatry has been late to the game. Forensic mental health has a few advantages in that there are recordable indicators within the behaviors that are monitored and measured. Use of technology to measure, monitor, and assess risk and change would have a significant impact for key stakeholders, including patients, care providers, and the community. Analytics offers an opportunity to increase our understanding of the forensic population, target effective programs and interventions, and direct more personalized care at the critical intersection of risk assessment and prediction—risk management. The eHARM-FV takes advantage of the capabilities afforded by big-data analytics to enhance the assessment, monitoring, and management of risk at the clinical interface, as well as the opportunity to use machine learning in forensic psychiatry. Through this presentation, the aggregator tool will be demonstrated and preliminary findings using machine learning to analyze eHARM-FV-based data will be discussed.

eHARM, Data Analytics, Forensic Psychiatry

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