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Using Wearables and Remote Technologies to Evaluate Risk for Suicide

Dr. Michelle Patriquin is the Director of Research and a Senior Psychologist at The Menninger Clinic and Associate Professor in the Department of Psychiatry and Behavioral Sciences at Baylor College of Medicine. She is board certified by the American Board of Professional Psychology (ABPP). The Menninger Clinic in an inpatient and outpatient mental health hospital that has been a nationally ranked in the top 10 by US News for over 30 years. She has authored over 120 publications or presentations on the subjective (e.g., trauma) and objective (e.g., heart rate/heart rate variability, sleep) precursors of mental illness. Her work is funded by federal (NIH, NSF) and foundation grants. She has been honored with multiple awards for her research and mentorship, including the New Investigator Award by the American Society of Clinical Psychopharmacology and the Rising Star Award by the Association for Psychological Science. She is has served as a standing reviewer for over 3 years on a NIH SBIR/STTR panel reviewing grants at the intersection of novel technology (apps, AI, sensors) and psychiatry/biobehavioral areas. At The Menninger Clinic, she leads a large, diverse team of faculty and staff to better understand mental health diagnoses and treatment outcomes. She is particularly interested in how we can develop and leverage new technologies to improve mental health in intensive treatment settings.

Abstract: The initial 90-days post-discharge from an inpatient psychiatric hospital is the highest risk period for suicide (Chung et al., 2017). Our research team has published a theory that hypothesizes that noctural inpatient safety precautions might be contributing to this high-risk period and generate an effect, the Safety-Sleep-Suicide Spiral (Gazor et al., 2020). Given the critical role that sleep plays in the mitigation of suicide risk, reducing the nighttime sleep disturbances related to noctural safety precautions, using alternative methods could interrupt the compounding effect of the Safety-Sleep-Suicide Spiral. Herein, one highly promising alternative method that may not disturb sleep will be discussed: continuous monitoring via wearable technology. Data will be presented from an ongoing study (N = 24 at present) examining objective and subjective sleep measures and their relationship with suicide risk (measured via the Suicide Behaviors Questionnaire-Revised, SBQ-R). Objective sleep is measured

via actigraphy (ActiGraph wGT3X-BT) continuously for a patient's entire length of stay (4-6 weeks) in an inpatient psychiatric hospital. Subjective sleep is measured through weekly self-report of nighttime sleep disturbance on the Pittsburgh Sleep Quality Index (PSQI), Insomnia Sleep Index (ISI) and daytime sleepiness on the Epworth Sleepiness Scale (ESS). Initial results demonstrate that increased suicide risk on the SBQ-R is associated with significantly shorter objective total sleep time (TST) measured via the actigraph ($p < .05$) and that increased suicide risk is related to more subjective sleep disturbance ($p < .05$). We will discuss the promise, as well as importance, of translating wearables data in order to improve inpatient outcomes monitoring and provide a less invasive real-time nocturnal safety assessment. Prior to this clinical translation, significant research is needed to improve the predictive power of wearable-based metrics as they relate to suicide risk and safety, as well as the development of clinically actionable visualization of these data. These challenges will also be discussed.