VIEWPOINT

Suicide as System Collapse and the Need for Deep Phenotyping

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Every field of medicine that has reduced mortality through precision care and biology-based prevention has done so by studying and caring for the most critically ill patients in their specialty. This approach is grounded in the study of point of system collapse, where signals of biological dysregulation are most dense and intense. From tensile strength under conditions of maximal shearing stress in material science to ejection fraction in patients after myocardial infarction, the signal to noise ratio to determine causes of system failure and recovery is most clear when system function is most critical. Defining, studying, and treating the patients at highest risk of death has saved lives in critical states while preventing more from reaching that state.

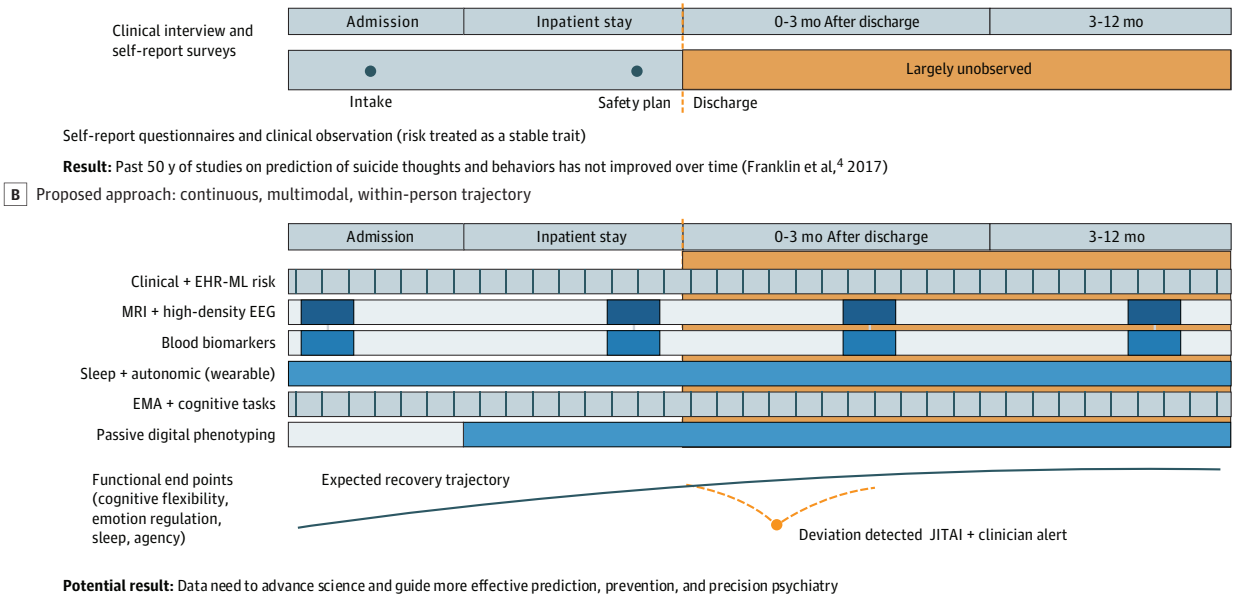
Psychiatry is a singular exception. Suicide and suicide attempts represent system collapse in psychiatry. Suicide is a leading cause of death worldwide and the third leading cause of death among individuals aged 15 to 29 years.[1] Despite being the most lethal mental health outcome, suicide receives 0.7% of mental health research funding, with 0.03% dedicated to treatment, despite an annual US economic cost of suicide and nonfatal self-harm of $510 billion.[2] Currently, patients are stabilized as inpatients and discharged with a verbal plan to stay safe. There is a roughly 270-fold increased risk of suicide in the month following the administration of our most powerful intervention (ie, inpatient hospitalization).[3]

We advocate that psychiatry follow the path of cardiology, oncology, and other disciplines when they moved from verbal description and late-stage presentation toward direct observability of biological states. The use of electrocardiography, telemetry, angiography, biomarkers, genomics, and longitudinal monitoring did not only improve classification; they enabled entirely new interventions. Psychiatry now possesses analogous opportunities through deep phenotyping, wearable sensing, digital monitoring, and rapid neuromodulatory and behavioral interventions.

We now have an ethical, clinical, and scientific responsibility to prioritize the intensive longitudinal study of patients with suicidal thoughts so psychiatry can build the metrology, mechanisms, and the treatment end points required for precision treatment.

Fifty years of traditional research using infrequent assessment to make predictions has not improved our ability to predict suicidal

Figure. Bar Graphs of Proposed Focus on Within-Person Trajectories to Understand and Treat Suicide Risk



A, Current approach relies on relatively infrequent use of patient verbal report and clinician interview/observation during hospitalization to assess risk and make treatment recommendations. B, Proposed approach: striped bands denote repeated discrete sampling; solid bands denote continuous acquisition. Orange shading marks the period of highest postdischarge risk. EHR-ML indicates machine learning applied to electronic health record data; EMA, ecological momentary assessment; JITAI, just-in-time adaptive intervention.

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behavior.[4] The recent Precision Psychiatry Roadmap called for deep phenotyping, multimodal integration, ecological measurement, longitudinal trajectories, and biology-informed frameworks that move beyond diagnostic categories.[5] Applying this roadmap to patients with suicidal thoughts would immediately exceed the current standard of care and create a new standard for the field. Recent studies have demonstrated how intensive digital monitoring can improve our understanding and prediction of changes in suicidal thoughts over short time spans.[6,7] Genetic and brain-imaging studies similarly have produced breakthroughs in understanding and have helped identify potential treatment targets.[8] However, these approaches and discoveries have not yet been integrated, used to intensively assess within-person trajectories, and translated for clinic-based research with patients in the midst of psychiatric system collapse.

This proposed shift requires changes to how psychiatric research is currently conducted and regulated. The next step is within-person longitudinal studies with deep phenotyping, beginning at admission following a suicide attempt and continuing through inpatient treatment, discharge, and at least one year of recovery (**Figure**). Admission would include multimodal phenotyping across cognition, emotional regulation, decision-making, sleep, physiology, ecological context, and digital behavior. In many settings, inpatient psychiatric care remains focused primarily on stabilization and safety management rather than on intensive mechanism-targeted treatment linked to measurable functional end points. Hospitalization should become an opportunity to reduce immediate danger and to measure and improve adaptive function itself. During hospitalization, treatment would shift toward rapid intensive interventions with measurable functional end points.

After discharge, those end points would be monitored to identify deviations from recovery trajectories before relapse or reattempt. The after-discharge period would provide an opportunity to explore the value of a strength-based approach derived from key skills of flourishing. Well-being skills have been shown to play a critical role in sustaining enduring positive change.[9]

The overall goal is adaptive preventive care analogous to monitoring in other chronic high-risk conditions. The Precision Psychiatry Roadmap biomarker taxonomy (diagnostic, monitoring, predictive, prognostic, and pharmacodynamic-response) provides the regulatory grammar for US Food and Drug Administration qualification of the end points these trajectories generate. Using this approach would create a direct translational bridge between neuroscience, longitudinal behavioral measurement, and clinical care by studying measurable recovery trajectories in the same individuals over time.

We must reframe the regulatory/ethical frameworks that have historically constrained suicide research. Individuals with suicidal thoughts are frequently excluded from psychiatric studies despite being among the populations most relevant to understanding acute risk and treatment response. Professional National Institutes of Health–supported consensus has been reached regarding safe and ethical study of those at risk for suicide using intensive within-person methods.[10] Institutional review boards and government oversight bodies should fast-track promising studies and treatments the same way it does for other leading causes of death. Prioritizing the study, understanding, and prevention of suicidal behavior should be an organizing principle of psychiatry.

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REFERENCES

1. World Health Organization. (2025). Suicide. https://www.who.int/news-room/fact-sheets/detail/suicide

2. Peterson C, Haileyesus T, Stone DM. Economic cost of US suicide and nonfatal self-harm. *Am J Prev Med*. 2024;67(1):129-133. doi:10.1016/j.amepre.2024.03.002

3. Chung D, Hadzi-Pavlovic D, Wang M, et al. Meta-analysis of suicide rates in the first week and the first month after psychiatric hospitalisation. *BMJ Open*. 2019;9(3):e023883. doi:10.1136/bmjopen-2018-023883

4. Franklin JC, Ribeiro JD, Fox KR, et al. Risk factors for suicidal thoughts and behaviors. *Psychol Bull*. 2017;143(2):187-232. doi:10.1037/bul0000084

5. Kas MJH, Penninx BWJH, Knudsen GM, et al. Precision psychiatry roadmap. *Mol Psychiatry*. 2025;30(8):3846-3855. doi:10.1038/s41380-025-03070-5

6. Coppersmith DDL, Ryan O, Fortgang RG, et al. Mapping the timescale of suicidal thinking. *Proc Natl Acad Sci U S A*. 2023;120(17):e2215434120. doi:10.1073/pnas.2215434120

7. Kleiman EM, Glenn CR, Liu RT. The use of advanced technology and statistical methods to predict and prevent suicide. *Nat Rev Psychol*. 2023;2(6):347-359. doi:10.1038/s44159-023-00175-y

8. Ceja Z, van Velzen LS, Campos AI, et al. Recent breakthroughs in genetic and brain structural correlates of suicidal behaviors. *Biol Psychiatry*. 2025;97(8):775-785. doi:10.1016/j.biopsych.2024.09.010

9. Dahl CJ, Wilson-Mendenhall CD, Davidson RJ. The plasticity of well-being. *Proc Natl Acad Sci U S A*. 2020;117(51):32197-32206. doi:10.1073/pnas.2014859117

10. Nock MK, Kleiman EM, Abraham M, et al. Consensus statement on ethical & safety practices for conducting digital monitoring studies with people at risk of suicide and related behaviors. *Psychiatr Res Clin Pract*. 2021;3(2):57-66. doi:10.1176/appi.prcp.20200029

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