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Biological Identity for Addiction Recovery Monitoring

by [Nick Clark](#) | Published March 27, 2026 | [PDF](#)

Addiction recovery monitoring relies on periodic check-ins, drug tests, and self-reports, all of which capture snapshots rather than trajectories. Between appointments, the patient is invisible to the care system. Biological identity's trust slope provides continuous behavioral trajectory monitoring that detects deviations correlating with relapse precursors, not by testing for substances but by detecting the behavioral pattern changes that precede relapse events.

The monitoring gap in addiction recovery

Relapse does not happen suddenly. It follows a behavioral trajectory: changes in sleep patterns, social withdrawal, disrupted routines, altered movement patterns, and shifts in communication frequency and tone. These precursors emerge days or weeks before a relapse event, but current monitoring systems do not detect them because they only observe the patient during scheduled interactions.

Drug testing confirms substance use after it has occurred. Self-reports depend on honesty during a period when the patient may be actively concealing behavioral changes. Counselor observations during weekly sessions capture a one-hour snapshot of a 168-hour week. The monitoring architecture is fundamentally discontinuous for a condition that requires continuous trajectory awareness.

Why wearable monitoring is not behavioral trajectory tracking

Wearable devices provide continuous physiological data: heart rate, sleep duration, step counts. But physiological data without a behavioral trajectory model is noise. Heart rate elevation could indicate exercise, stress, substance use, or illness. Step count reduction could indicate injury, depression, or a change in work schedule. The data is continuous, but the interpretation requires a model of what normal looks like for this specific individual and how their normal is changing over time.

Biological identity provides this model. The trust slope establishes a behavioral trajectory for the individual and detects deviations from that trajectory. The same physiological data that is ambiguous without context becomes interpretable when evaluated against the person's accumulated behavioral history.

How biological identity addresses recovery monitoring

Biological identity constructs a behavioral trajectory from ambient signals: movement patterns, routine consistency, social interaction frequency, sleep regularity, and communication patterns. The trust slope tracks this trajectory continuously, not as surveillance but as a continuity function that detects when the trajectory deviates from the individual's established recovery pattern.

A patient in stable recovery develops a characteristic behavioral trajectory: regular sleep patterns, consistent daily routines, maintained social connections. When the trajectory begins to deviate, the trust slope detects the change. Sleep irregularity increasing, routine consistency decreasing, social interaction frequency dropping, these are trajectory deviations that the trust slope quantifies and reports before they accumulate into a clinical event.

The state inference capability infers the patient's current state from behavioral signals without requiring self-report. This is not a diagnosis. It is a trajectory assessment: the behavioral trajectory is consistent with the recovery baseline, or the trajectory is deviating in patterns that historically correlate with relapse risk. The care team receives trajectory alerts, not diagnostic labels.

Privacy governance ensures that the monitoring operates without storing raw behavioral data. The trajectory is maintained as a trust slope function, and the biological signals that inform it are processed through hashing that prevents reconstruction. The patient consents to trajectory monitoring, not to behavioral surveillance.

What implementation looks like

A recovery program deploying biological identity integrates trajectory monitoring through the patient's existing devices and ambient environment. Smartphone sensors contribute movement and routine data. Communication metadata contributes social interaction patterns. The system builds a recovery trajectory baseline during the stabilization period.

For outpatient programs, biological identity provides the continuous monitoring between appointments that current systems lack. Counselors receive trajectory deviation alerts that enable proactive outreach rather than reactive crisis response.

For residential treatment programs transitioning patients to outpatient care, biological identity provides continuity of monitoring across the transition. The behavioral trajectory established during residential treatment continues into outpatient monitoring, enabling early detection of post-transition destabilization.

[Biological Identity All 21 steps →](#)

Identity from behavioral continuity. No stored templates. No keys.

Primary Technical Disclosure

[◦ Continuity-Based Biological Identity Using Trust-Slope Validation](#)

Secondary Technical

[◦ Biological Trust Slope Construction: Identity Through Behavioral Continuity](#)[◦ Contact, Non-Contact, and Passive Resolution Modes for Biological Identity](#)[◦ Biological Hash Generation With Domain Separation](#)[◦ Biological State Inference From Continuity Baseline](#)[◦ Cross-Modal Biological Hash Fusion](#)[◦ Biological Continuity as Handoff Verification](#)[◦ Relational Trust Trajectories: Trust as Temporal Relationship](#)[◦ Identity as Behavioral Continuity: Beyond Single-Point Capture](#)[◦ Biological-Device-Agent Identity Layering](#)[◦ Biological Signal Acquisition Tiers](#)[◦ Noise-Tolerant Feature Normalization for Biological Signals](#)[◦ Stable Sketching and Helper Data for Biological Features](#)[◦ Predictive Identity Trajectory: Forecasting Biological Identity Evolution](#)[◦ Population-Scale Collision Resistance for Biological Hashes](#)[◦ Adaptive Indexing of Biological Trust Slopes](#)[◦ Delayed and Sparse Validation for Disconnected Environments](#)[◦ Policy-Governed Capability Binding for Biological Identity](#)[◦ Multi-Identity Delegation Without Biological Data Disclosure](#)[◦ External Credential Integration With Trust-Slope Integrity](#)[◦ Anti-Spoofing Through Continuity Validation](#)[◦ Identity Lifecycle Management and Phase-Based Reseeding](#)[◦ Quorum-Based Biological Identity Recovery](#)[◦ Privacy Governance and Revocation for Biological Identity](#)[◦ Human-Agent Primitive Integration for Biological Identity](#)

Applications (General)

[◦ Airport Security Without Biometric Databases](#)[◦ Estate Verification Through Behavioral Continuity](#)[◦ Biological Identity for Elder Care Continuity](#)[◦ Biological Identity for Child Development Tracking](#)[• Biological Identity for Addiction Recovery Monitoring](#)[◦ Biological Identity for Workplace Safety Monitoring](#)[◦ Biological Identity for Athletic Performance](#)[◦ Biological Identity for Immigration Processing](#)

Applications (Specific)

[◦ TSA PreCheck Matches Templates, Not Continuity](#)[◦ Global Entry Verifies Documents, Not Biological Continuity](#)[◦ Face ID Matches a Stored Model, Not a Living Trajectory](#)[◦ Samsung Knox Guards the Container, Not the Identity](#)[◦ ID.me Verifies Documents, Not Biological Continuity](#)[◦ Secure Scores Risk at a Single Point in Time](#)[◦ Plaid Identity Verifies Financial Accounts, Not Biological Persons](#)[◦ Onfido Detects Document Fraud, Not Identity Drift](#)[◦ Veriff Captures Sessions, Not Trajectories](#)[◦ Trulioo Queries Databases, Not Biological Trajectories](#)

[Biological Identity overview →](#)

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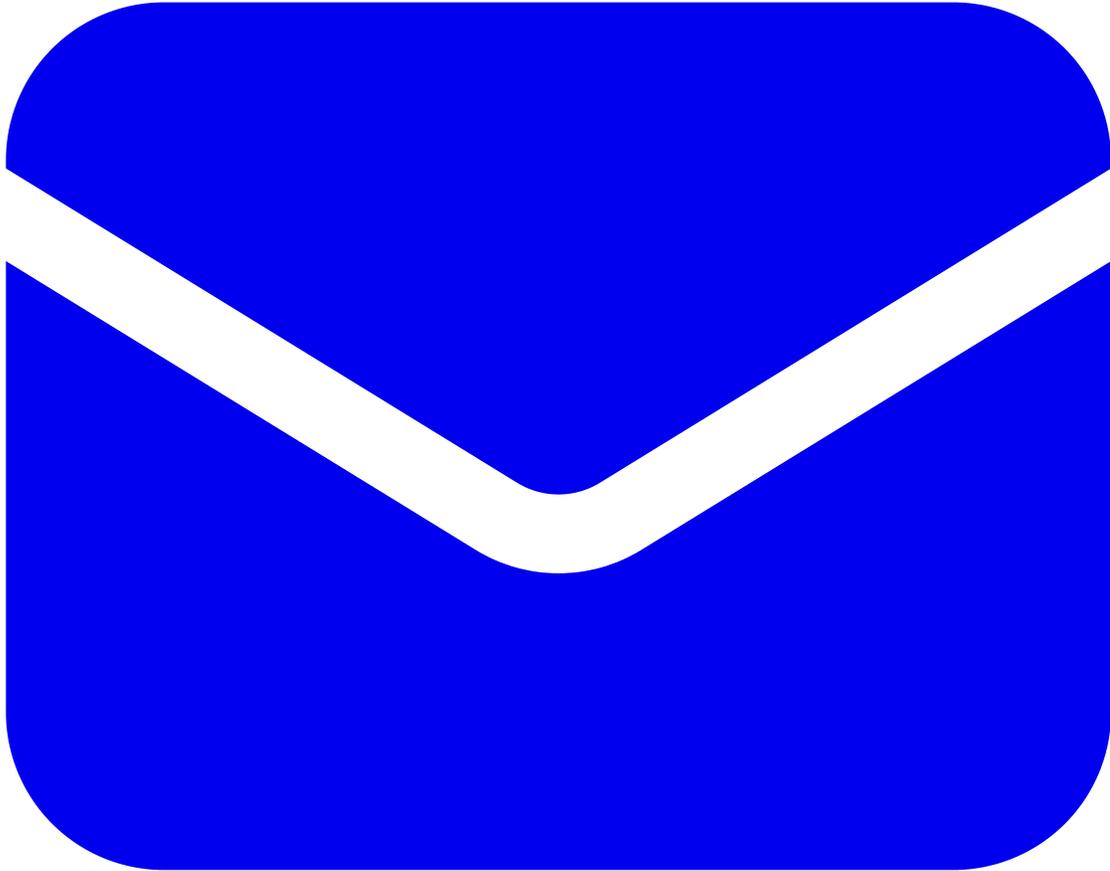
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