Abstract

A system for real-time detection and mitigation of drug-library bypass in infusion pumps is disclosed. The pump, or a network-connected monitoring module, continuously evaluates programming mode, infusion parameters and contextual data to identify delivery without an active dose-error-reduction profile or beyond predefined limits. When such operation is detected, the system produces audible and/or visual bedside alerts, can pause flow until user acknowledgement or reprogramming, logs the event with user attribution, and transmits status data to a server. The server, when present, cross-checks electronic medication orders, distributes notifications to remote devices, escalates unresolved events, and may issue control commands back to the pump. An optional biometric layer employs depth-sensing facial recognition within a secure enclave to bind clinician identity to safety-critical actions and generate cryptographically signed audit records. Stand-alone or networked configurations enable continuous supervision of infusions and automated corrective workflows across diverse clinical environments.