

Abstract

SmartStop is an automated infusion-pause safety system that **compiles physician-approved standing-order templates into machine-executable rules**. A compiler (100) transforms each template and, through a **scope-of-practice validator** (120), restricts resulting actions to nurse-authorized “pause/hold” commands. A real-time rule engine (150) continuously evaluates live laboratory and device data; when a rule condition is satisfied and the laboratory result passes an upstream **quality-control gate** (310), the system issues an electronic pause to the networked infusion pump and triggers a **tiered alert-escalation ladder** to clinical staff. Every event is written to the electronic health record under the ordering provider and **cryptographically chained in an immutable audit ledger** for regulatory review. Upon network or CDS outage the system shifts to a manual fallback pathway while keeping protocols visible to clinicians. The invention accelerates response to hazardous conditions, reduces nurse workload, and ensures documented compliance with hospital and regulatory requirements.