



QBurst

A High AI-Q<sup>™</sup>  
Company

# Remote Hypertension Monitoring for Proactive Patient Care

Enabling real-time vitals capture and EHR integration to improve hypertension management and proactive patient care.

## Overview

- Developed a secure, scalable remote monitoring solution integrated with the client's Electronic Health Record (EHR) system.
- Implemented asynchronous, fault-tolerant architecture using AWS serverless components for uninterrupted data flow.
- Delivered measurable ROI of 22% at 55% patient compliance, with potential ROI up to 93.3% when costs are optimized.



## Client Profile

The client is a prominent academic medical center operating multiple hospitals and outpatient centers across the US. With a large workforce of clinicians, educators, and researchers, the organization focuses on advancing patient care and clinical research through technology-driven innovation.

## Challenges: Episodic Care Limitations

- Inability to track patient blood pressure trends between scheduled visits, limiting clinical insight
- Manual check-ins were resource-intensive and unsustainable at scale
- Lack of real-time vitals integration with the external EHR hindered clinical intervention
- No secure, scalable, or compliant method to ingest and process device-generated data

# QBurst Solution: Real-time, Secure Data Orchestration

The solution provides real-time interoperability and secure data orchestration between connected medical devices and the client's EHR system. Patient vitals captured through Bluetooth devices are transmitted via the Validic integration platform and processed within our system for FHIR-compliant transmission to the EHR.

Leveraging AWS serverless components, we developed an asynchronous, decoupled, and fault-tolerant data processing system. This architecture supports continuous, non-blocking data flow, even under high workloads, while maintaining reliability and data accuracy.

End-to-end encryption safeguards sensitive identifiers, while a tracking layer provides full visibility into event processing. Integrated observability—covering logs, metrics, distributed tracing, and automated alerts—supports early anomaly detection and ensures dependable operations.

We worked closely with the client to design a secure ingestion pipeline, validate FHIR interoperability, enable real-time monitoring, and perform load-tested performance assessments prior to deployment.

## Technical Highlights

- Asynchronous ingestion via Amazon API Gateway and Elastic Load Balancing
- Decoupled, fault-tolerant message handling using Amazon SQS
- Serverless processing with AWS Lambda for scalable, event-driven execution
- FHIR-compliant data transformation workflows
- Secure encryption of sensitive identifiers using AWS KMS
- Processing-state persistence and traceability through Amazon DynamoDB
- Integrated observability with Amazon CloudWatch and AWS X-Ray
- Dead Letter Queues for automated retries and safe recovery

## Clinical, Operational & Financial Outcomes

- Achieved 22% ROI at 55% compliance, with potential up to 93.3% when costs are streamlined
- Improved clinical quality and decision-making through continuous vitals visibility
- Proactive care with early detection of risk trends reducing complications
- Automated ingestion and workflows reduced manual effort, clinician workload and burnout
- Scalable architecture supports future expansion and reinforced the client's position as a leader in digital, patient-centric care