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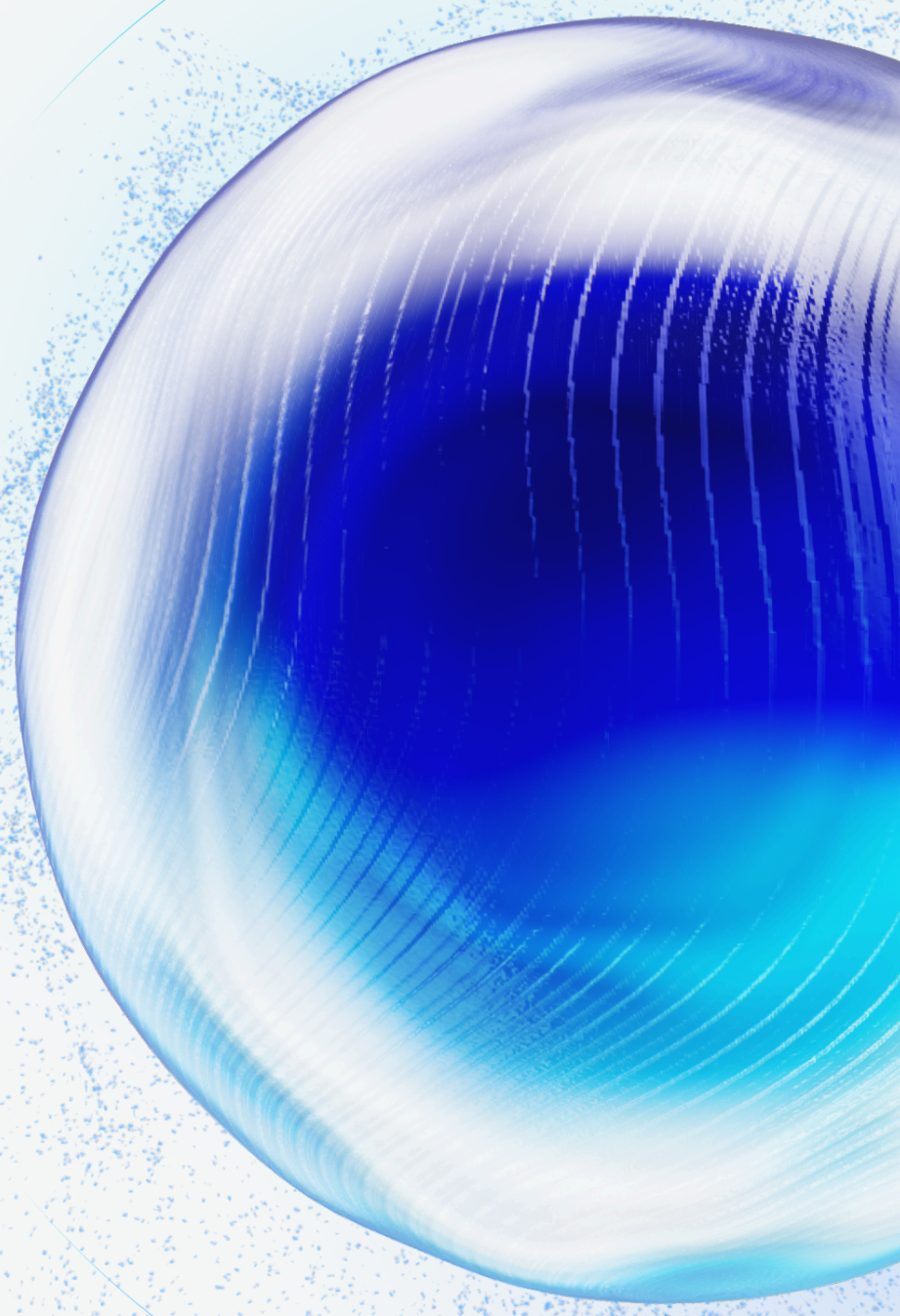

Case Study

Pilot to Proven

Implementing Heart Failure Monitoring at Penn Medicine

Standardized alerts, symptom screening, and aligned EP–HF workflows in practice.

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Executive Summary

Heart failure prevalence continues to rise, and implantable cardiac devices now generate increasingly sophisticated diagnostic data capable of identifying worsening heart failure weeks before symptoms escalate. However, in many health systems, actionable heart failure (HF) signals remain embedded within electrophysiology (EP)-centric workflows, limiting timely clinical intervention.

At Penn Presbyterian Medical Center (PPMC), more than 5,500 patients were remotely monitored for device function. However, prior to structured HF monitoring, only 18 patients were actively enrolled in a defined heart failure protocol, managed through a CardioMEMS-based monitoring approach, despite a substantially larger population capable of generating HF diagnostics.

In partnership with Octagos, PPMC implemented a structured HF remote monitoring program built around standardized alert thresholds, symptom screening protocols, and protocol-driven clinical intervention.

The program evolved in phases

01

CardioMEMS monitoring established the initial foundation (18 patients).

02

A structured workflow was piloted using Boston Scientific HeartLogic–enabled devices.

03

Following pilot validation, the program expanded to a larger cohort of HF monitoring patients.

The eight-week HeartLogic pilot served as operational proof of concept, demonstrating that HF diagnostics could be translated into timely patient outreach and proactive clinical management without increasing staffing.

As device technology advanced, the volume of clinically relevant alerts continued to increase. However, staffing levels remained constant, and HF diagnostics were typically reviewed within EP-focused workflows alongside routine device transmissions.

Key outcomes from eight-week pilot

Impact at a Glance

The program expanded to 154 actively monitored HF patients, establishing a scalable model for proactive heart failure management.

Outcomes

88
patients included in HeartLogic pilot cohort

78
HeartLogic alerts identified

92%
alerts (72/78) addressed within three days

12.5
minutes average clinician time per actionable alert

436
patients identified as PPMC's actionable HF population

154
routine HF transmissions generated during pilot

~$10,590 projected reimbursement opportunity during eight-week pilot

By aligning EP and HF teams around a shared workflow and leveraging AI-supported triage with certified clinical oversight, PPMC established a scalable heart failure monitoring model that enables earlier intervention, clearer clinical prioritization, and operational efficiency without increasing staffing.

Organizational Profile

Penn Presbyterian Medical Center (PPMC)

Philadelphia, Pennsylvania

Part of the University of Pennsylvania Health System. PPMC is a high-volume academic medical center supporting complex cardiac patients across electrophysiology and heart failure specialties.

Snapshot

365
inpatient beds

6
electrophysiologists

6
heart failure physicians

13+
advanced practice providers across EP and HF

~5,500
remotely monitored device patients

1
dedicated remote monitoring APP (5 days per week)

The Challenge

Actionable HF Data Without a Standardized Pathway

Device-based HF diagnostics such as HeartLogic can detect worsening heart failure up to 30 days before clinical decompensation.

However, prior to implementation of the structured program at PPMC, these signals were embedded within routine device transmissions rather than triggering a defined clinical workflow.

Key challenges included

- Rising alert volume without additional staffing
- HF diagnostics embedded within EP-centric device reports
- Increasing time spent reviewing routine, non-actionable transmissions
- Variable outreach timelines
- No standardized symptom screening or escalation protocol
- Limited scalability across eligible HF patients

Importantly, HF alerts were not systematically documented or acted upon prior to the program, meaning clinicians often saw elevated HF scores without a clear process for intervention.

As one clinician described

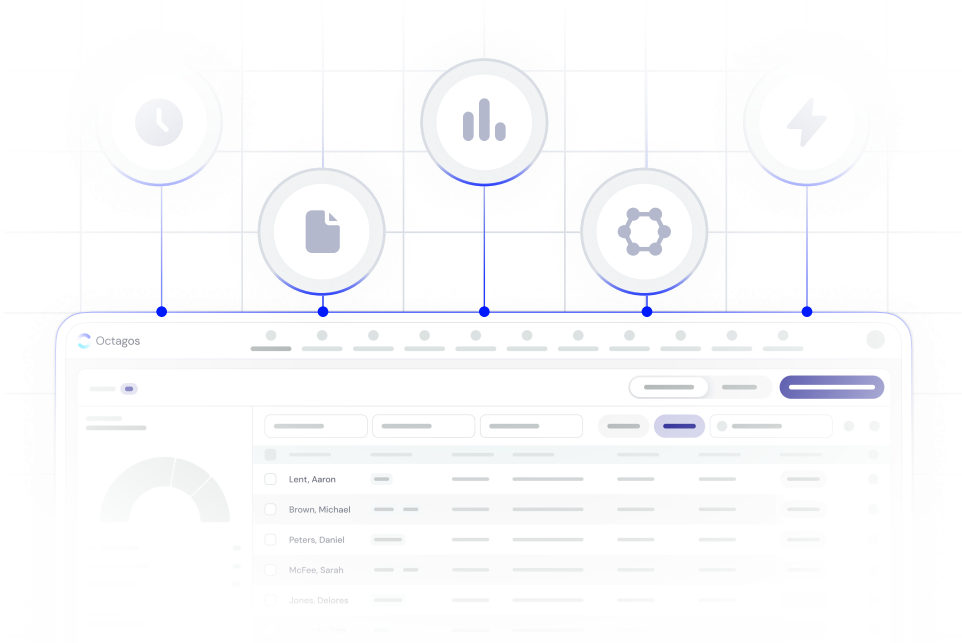
> “We kept seeing these numbers and thinking, what do we do about this? We had information that was actionable, but no structured way to use it.”

The opportunity at PPMC was not a lack of data. It was a lack of operational structure to convert device-generated insights into consistent clinical action.

The Solution

A Structured HF Monitoring Program Powered by Octagos

PPMC partnered with Octagos to design and operationalize a structured HF remote monitoring workflow.



Multidisciplinary Clinical Alignment

A cross-functional team representing

- EP physicians
- HF physicians
- Nurses
- Advanced practice providers
- Administration

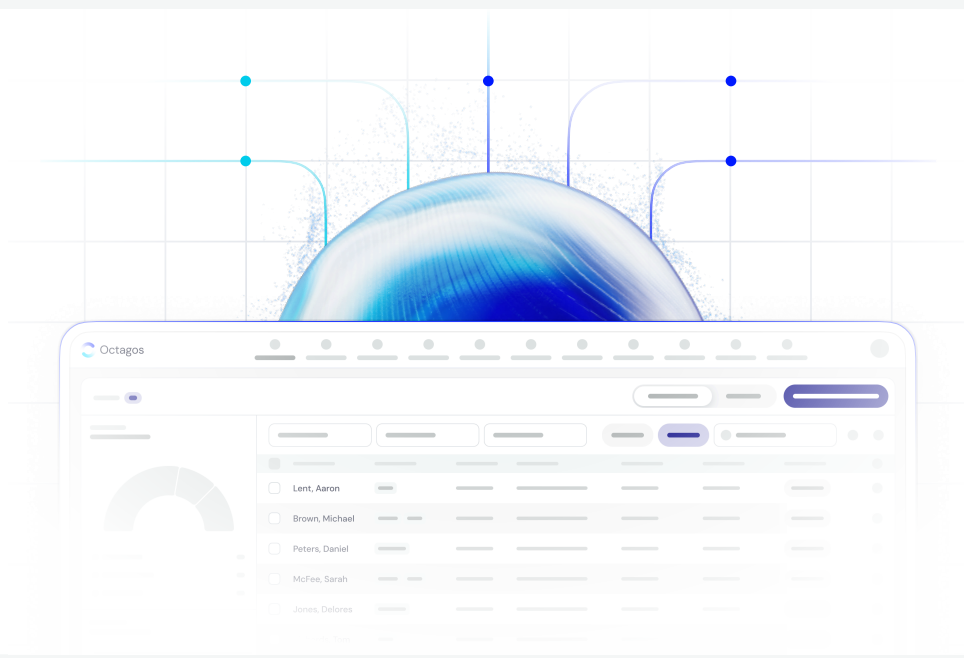
Aligned on

- Standardized HeartLogic alert thresholds
- Symptom screening protocols
- Protocol-driven diuretic escalation
- Defined documentation pathways
- Escalation triggers and follow-up cadence

The Pilot: Eight Weeks to Operational Proof

Following the initial onboarding of CardioMEMS patients, PPMC launched an eight-week pilot focused on Boston Scientific HeartLogic–enabled devices.

The objective was to refine workflow, evaluate clinical impact, and assess financial sustainability before expanding the program more broadly.



HeartLogic Workflow Overview

>16

HeartLogic score >16 triggered patient outreach and symptom screening.

>20

Scores >20 triggered protocol-driven diuretic escalation regardless of symptoms.

<6

Automatic repeat transmissions were reviewed weekly until the recovery threshold (<6) was achieved.

Documentation was standardized using structured telephone encounter templates.

Repeat alerts prompted structured reassessment and escalation as needed.

Pilot Results (8 Weeks)

During the eight-week pilot period

88

patients were included in the HeartLogic monitoring cohort

78

HeartLogic alerts were identified

92%

alerts resulted in patient outreach within three days

Additional operational insights included

16 hours and 10 minutes

of total RN/APP time spent managing alerts

12.5 minutes

minutes average clinician time per actionable alert

154

routine HF transmissions generated during the pilot period

The high outreach rate demonstrated consistent adherence to the structured protocol, translating device alerts into timely patient contact.

Operationally, clinicians spent less time reviewing routine transmissions and more time focused on patients with elevated HF risk.

Prior to implementing this workflow, HF diagnostic signals were visible within device reports but were not systematically acted upon.

Rapid Expansion

Following pilot validation, the HF monitoring program scaled quickly

154

Enrollment expanded from the initial 18 CardioMEMS patients and 88 HeartLogic pilot patients to 154 actively monitored HF patients.

436

In addition, the care team identified 436 patients as the clinic's actionable HF population, representing patients whose devices generate HF diagnostic signals that could support proactive management.

This growth occurred without adding new clinical staff, supported by AI-assisted remote monitoring and IBHRE-certified clinical review before reports reached the care team.

From Reactive Care to Proactive Heart Failure Management

Prior to implementing the structured HF monitoring workflow, clinicians often relied on patients to contact the care team after symptoms developed.

With device-derived HF diagnostics now incorporated into a defined protocol, clinicians can intervene earlier by adjusting medications, providing patient education, and escalating care when necessary.

This shift enables a more proactive model of heart failure management.

As one clinician described

"Before this program, we were relying on patients to reach out once they developed symptoms. Now we can identify patients early, adjust medications, and actively manage them before they deteriorate."

This approach not only improves clinical responsiveness but also strengthens patient-provider relationships.

As one clinician described

"Being proactive builds trust with patients because they know we're keeping a close eye on them."

Strengthening the EP–HF Partnership

Another significant outcome of the program was improved collaboration between electrophysiology and heart failure teams.

Historically, HF diagnostics generated by implantable devices were reviewed primarily within EP workflows, often without a clear pathway for HF management.

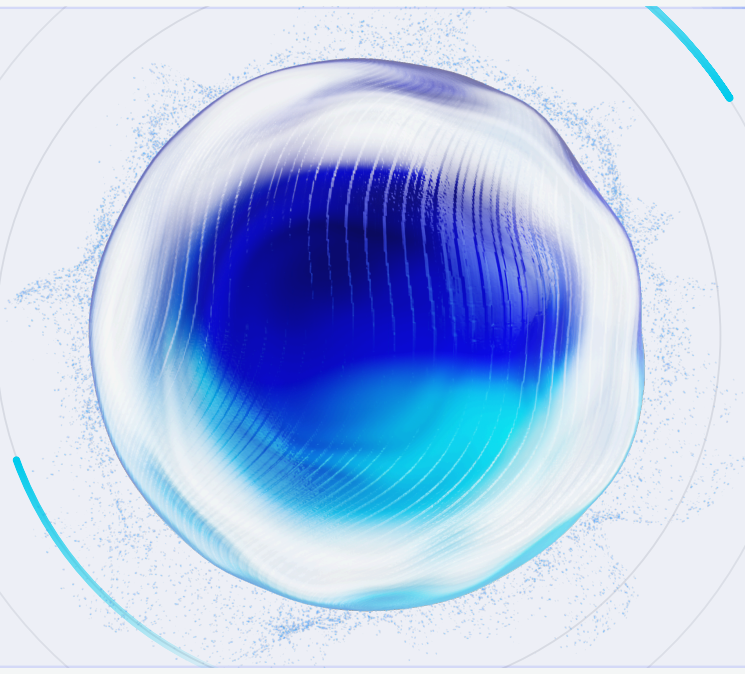
Today, the teams meet regularly to review program performance, identify high-risk patients who are not yet enrolled, and coordinate referrals to heart failure specialists.

This collaboration has strengthened relationships across departments and created a shared framework for managing HF diagnostics.

Technology-Enabled Clinical Focus

The Two-Brain Approach™

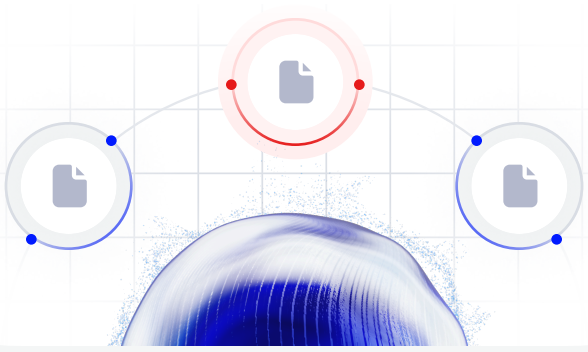
Octagos supports this workflow using its Two-Brain Approach, combining Atlas AI™ with IBHRE-certified human review.



The process includes

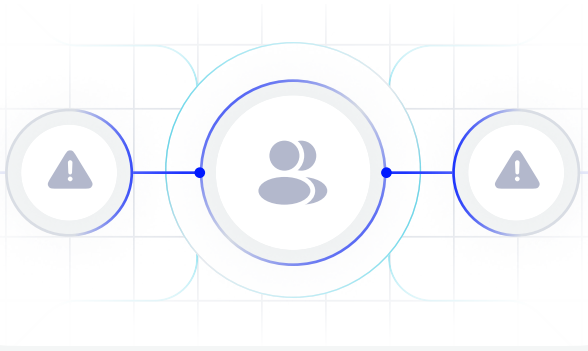
AI Triage

Atlas AI filters routine transmissions and identifies abnormal findings.



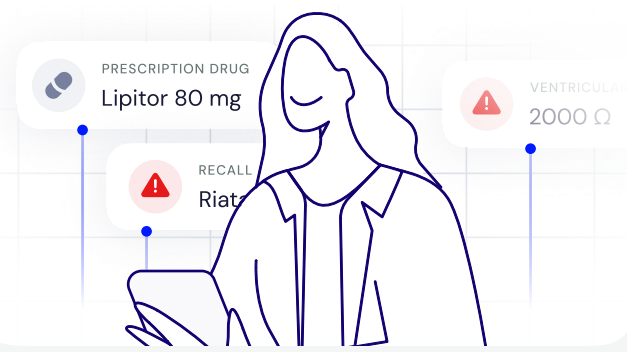
Focused Escalation

Only clinically meaningful alerts are surfaced to EP and HF teams.



Clinical Validation

IBHRE-certified device specialists review alerts and apply clinical interpretation.



This human-in-the-loop approach allows clinicians to practice at the top of their license while maintaining clinical oversight and safety.

HF data is presented through clear summaries, trend graphs, and structured reporting rather than being buried within full manufacturer PDFs.

Economic Sustainability

Heart failure remote monitoring can be reimbursed using CPT 93297 for implantable cardiovascular physiologic monitoring on a 31-day cycle, with G2066 supporting technical reimbursement.

During the eight-week pilot

154

routine HF transmissions were generated

$10,590

Approximately $10,590 in Medicare reimbursement opportunity was identified

Beyond the pilot cohort, PPMC identified a much larger opportunity.

Device inventory analysis revealed

Boston Scientific

326

Boston Scientific HeartLogic–capable devices

Medtronic

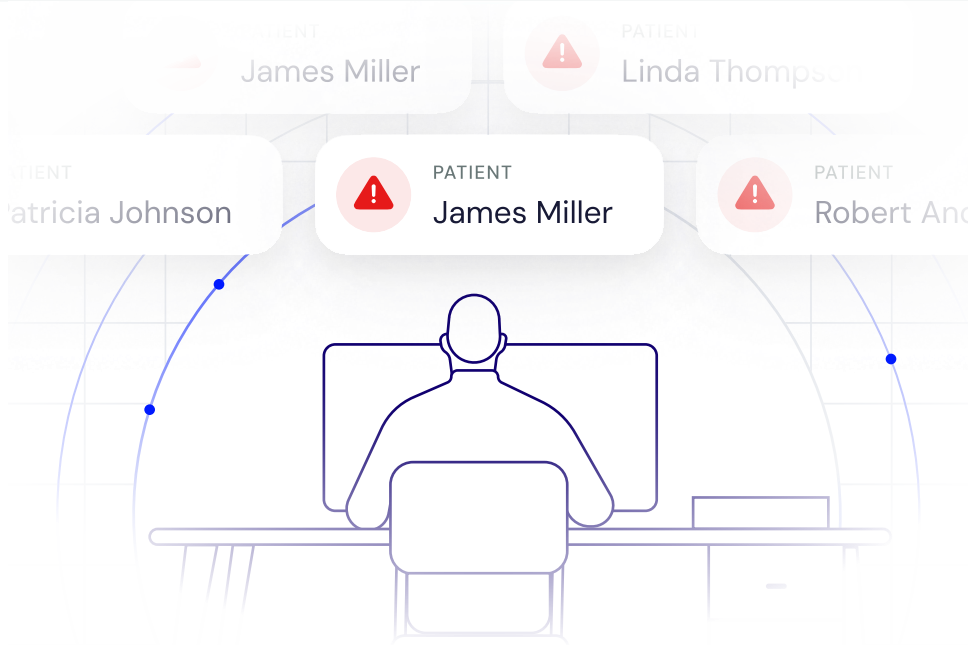
578

Medtronic TriageHF–capable devices

This represents 904 total devices capable of generating HF diagnostics, creating a significant opportunity for expanded monitoring and reimbursement when incorporated into structured workflows.

What's Next

PPMC continues to expand the HF monitoring program by identifying high-risk patients who are not yet enrolled and coordinating referrals to the heart failure team.



The Next Phase

The next phase of the program includes integrating Medtronic TriageHF–enabled devices into the monitoring workflow.

EP and HF teams now meet regularly with program leadership and Octagos to review progress, troubleshoot operational challenges, and identify opportunities for further expansion.

Impact

The structured HF monitoring program enabled PPMC to

- Translate device-derived HF diagnostics into consistent clinical action
- Achieve 92% outreach within three days for actionable alerts
- Average 12.5 minutes clinician time per alert
- Identify a 436-patient actionable HF population
- Strengthen collaboration between EP and HF teams

Most importantly

Clinicians can now intervene earlier in the progression of heart failure rather than waiting for patients to deteriorate.

Conclusion

From Reactive Alert Review to Proactive HF Management.

Within eight weeks, PPMC demonstrated that structured workflows and clinically guided triage can convert device-derived HF diagnostics into timely patient intervention at scale.

The program provides a repeatable framework for health systems seeking to operationalize existing device data, improve clinical responsiveness, and expand heart failure monitoring without increasing staffing burden.

By combining structured protocols with AI-assisted triage and certified clinical oversight, PPMC transformed previously underutilized HF diagnostics into a proactive, scalable model for patient care.

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