

# Preventing Avoidable ED Visits

Closing the Gap Between  
Prediction & Prevention to  
Reduce Emergency Department  
Utilization in VBC Populations



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**MARCH 26 – 27, 2026**  
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<https://www.wcforum.com/conferences/vbh>

# Presenters

**Rey Villar**

Digital Solutions Architect @  
Calcium



**Paul Quindry**

SVP, Product Management @  
Pulse Data



# Agenda

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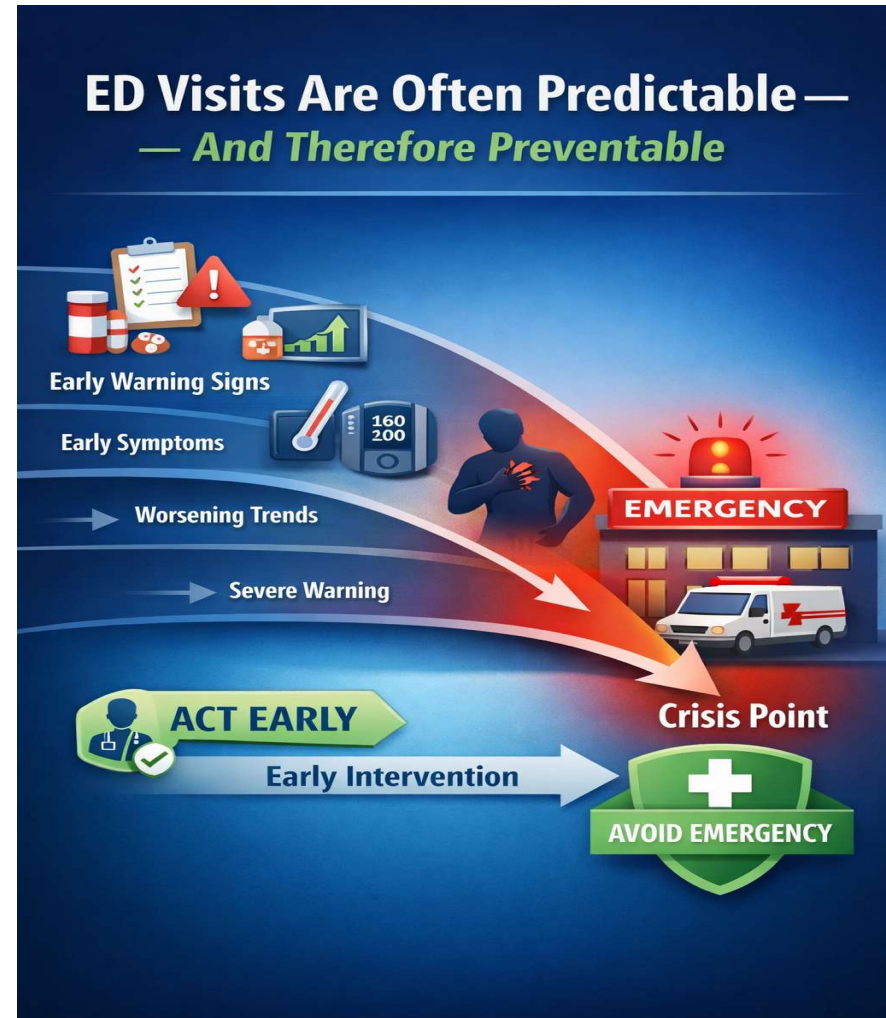
- I. The ED Utilization Challenge in VBC
- II. Why Traditional ED Reduction Strategies Fall Short
- III. Predictive Analytics for Early Risk Detection
- IV. From Prediction to Prevention
- V. Financial Impact in Value-Based Care

# Predictable is Preventable

Most emergency visits do not occur suddenly.

In many cases, early signals appear days or weeks before the crisis point.

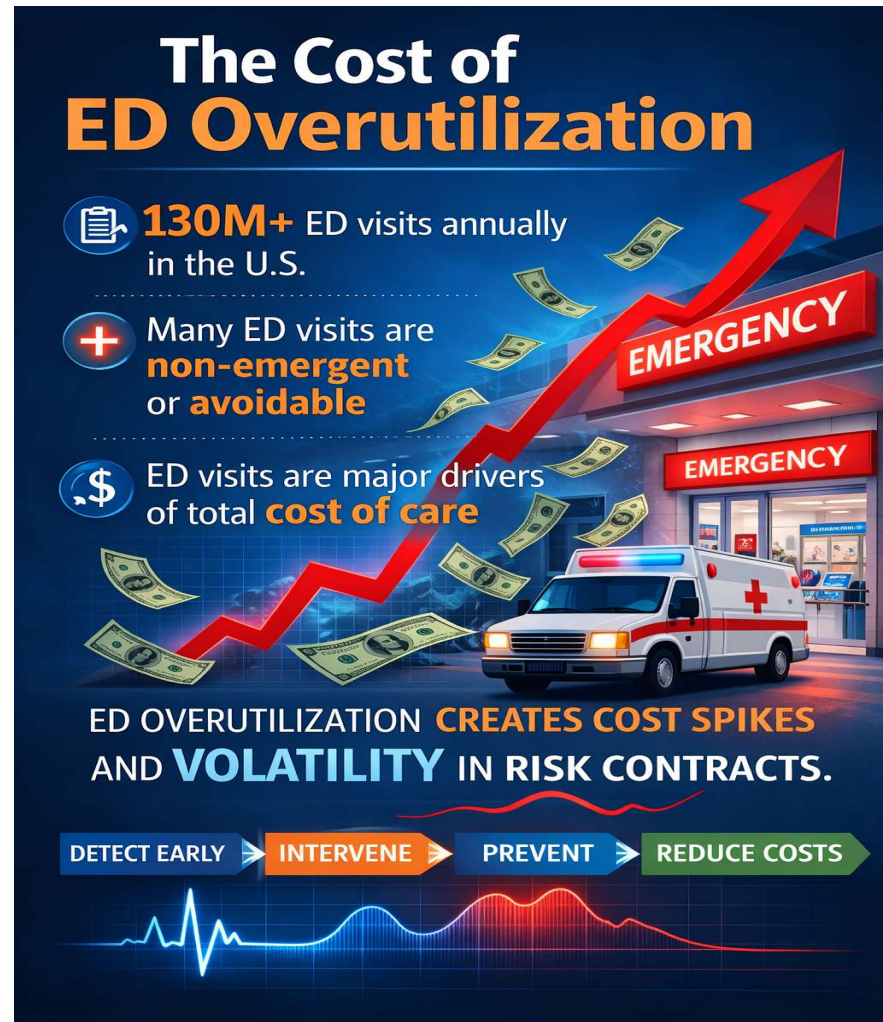
If we can detect those signals and intervene early, we can stabilize patients before they require emergency care.



# The Cost of ED Utilization

- Number of emergency department visits resulting in hospital admission: 17.8 million
- Number of emergency department visits resulting in admission to critical care unit: 3.1 million
- Percent of visits with patient seen in fewer than 15 minutes: 40.6%
- Percent of visits resulting in hospital admission: 11.5%

Source: CDC & AHRQ



# Why ED Visits Occur



## Why ED Visits Occur

Many ED visits are potentially avoidable

-  Chronic disease exacerbation
-  Medication non-adherence
-  Poor care coordination
-  Limited after-hours access
-  Patient uncertainty about symptoms

# High ED Utilization Populations

Emergency visits frequently trigger downstream events:

- Observation stays
- Hospital admissions
- Diagnostic testing
- Specialist referrals

## High ED Utilization Populations Impact VBC

Emergency visits frequently trigger downstream events, with significant impact on VBC programs

Typical VBC populations with highest ED risk:

-  Diabetes
-  COPD
-  Heart failure
-  Behavioral health



# Poll Question 1

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*How confident are you that your organization can identify patients at risk for ED visits before they occur?*

1. **Very confident** — we use predictive analytics to identify ED risk early
2. **Moderately confident** — we have risk stratification tools but limited prediction capability
3. **Somewhat confident** — we rely mostly on EHR or claims reports
4. **Not very confident** — we typically identify risk after utilization occurs
5. **Not confident at all** — we currently have no systematic way to identify ED risk

# Why Traditional Approaches Fail

## Coordination After Discharge

- Focused on post-event stabilization, not preventing the initial ED visit.

## ED Follow-Up Programs

- Intervene after the emergency visit has already occurred, limiting impact on utilization.

## Patient Education Campaigns

- Helpful but not personalized or timely enough to address early deterioration.

## Nurse Call Lines

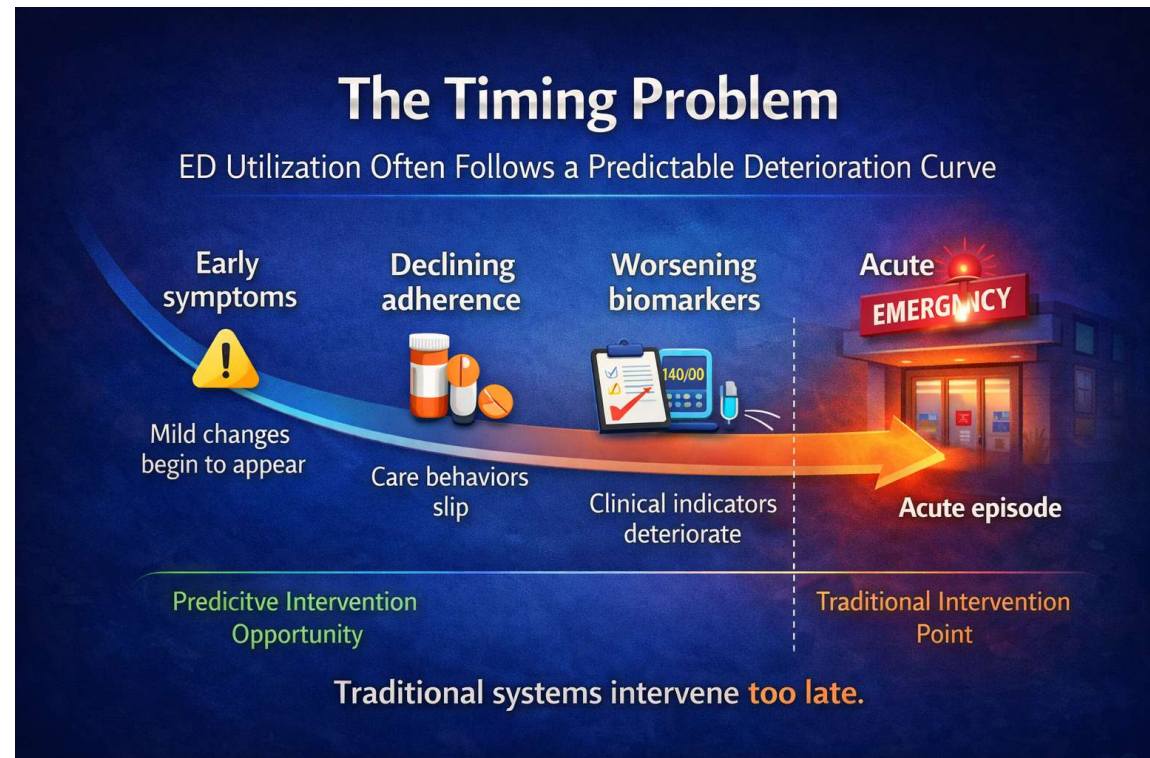
- Reactive support that depends on patients recognizing symptoms and seeking help first.

# The Timing Problem

ED utilization often follows a predictable clinical deterioration curve:

1. Early symptoms
2. Declining adherence
3. Worsening biomarkers
4. Acute episode

Traditional systems intervene too late.



# Reforming EDs with Predictive-Prevention

Calcium & PulseData have developed a Closed-Loop Predictive Prevention framework for Value-Based Care

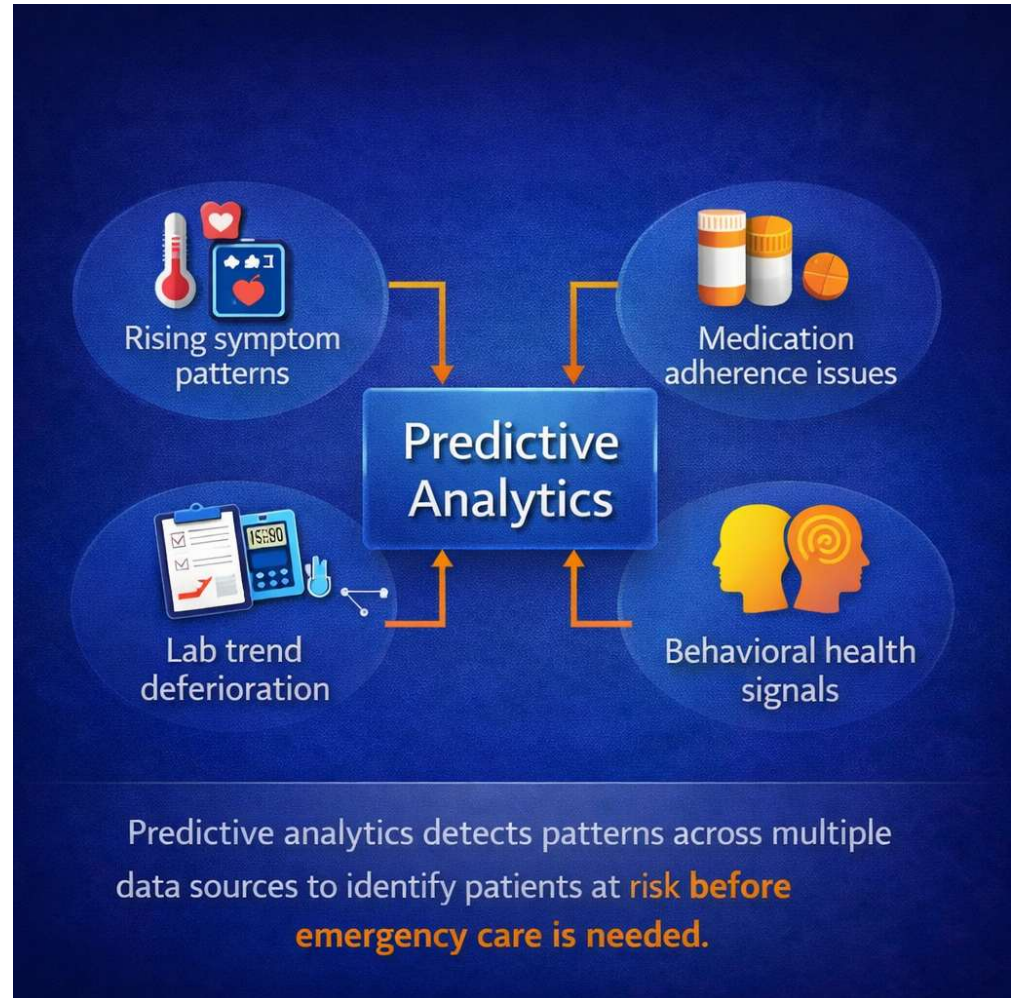
1. Predict
2. Prioritize
3. Prevent



# What Predictive Analytics Looks Like in Practice

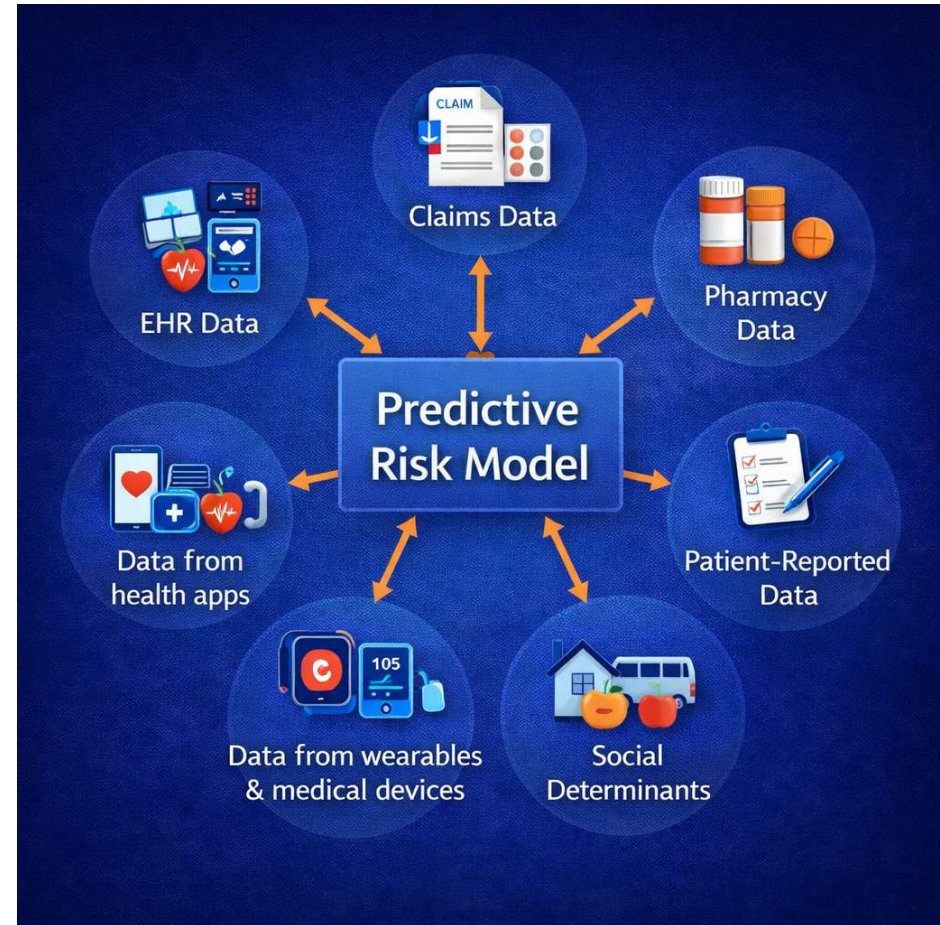
## Predictive Models Identify Early Warning Signals

- **Rising symptom patterns**  
Patient-reported symptoms or remote monitoring signals show early deterioration before a crisis occurs.
- **Medication adherence issues**  
Missed refills, skipped doses, or declining adherence patterns signal increased risk of acute events.
- **Lab trend deterioration**  
Gradual worsening in clinical indicators such as glucose levels, blood pressure, oxygen saturation, or weight changes.
- **Behavioral health signals**  
Mental health stressors, anxiety, depression, or social instability that can trigger acute care utilization.



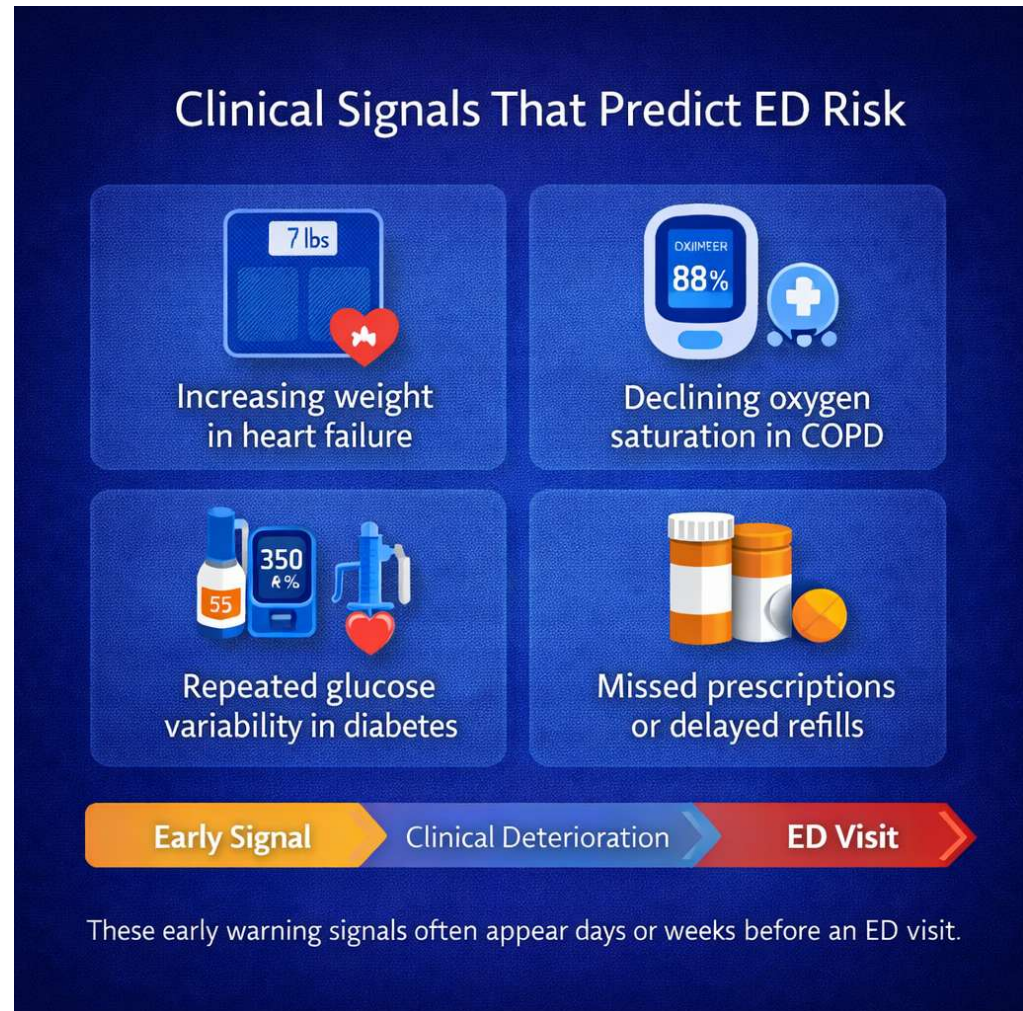
# Data Sources That Predict ED Risk

- **EHR clinical data** – Diagnoses, vitals, lab results, clinical notes, and care history
- **Claims history** – Patterns of past utilization including ED visits, admissions, procedures, and provider encounters.
- **Medication fill patterns** – Pharmacy claims and refill timing that indicate medication adherence or gaps in therapy.
- **RPM data** – Continuous patient data, from integrated devices, apps and wearables.
- **Patient-reported symptoms** – Digital check-ins, symptom surveys & patient engagement platforms.
- **SDoH** – Housing instability, transportation barriers, food insecurity, and other non-clinical factors influencing ED risk.



## Example: ED Risk Indicators

- **Increasing weight in heart failure patients**  
Rapid weight gain can indicate fluid retention and worsening heart failure.
- **Declining oxygen saturation in COPD**  
Falling oxygen levels often signal an impending respiratory exacerbation.
- **Repeated glucose variability in diabetes**  
Frequent glucose spikes or drops may indicate poor disease control.
- **Missed prescriptions or delayed refills**  
Medication gaps can quickly lead to destabilization of chronic conditions.



## Poll Question 2

*What data sources do you currently use to identify ED risk?*

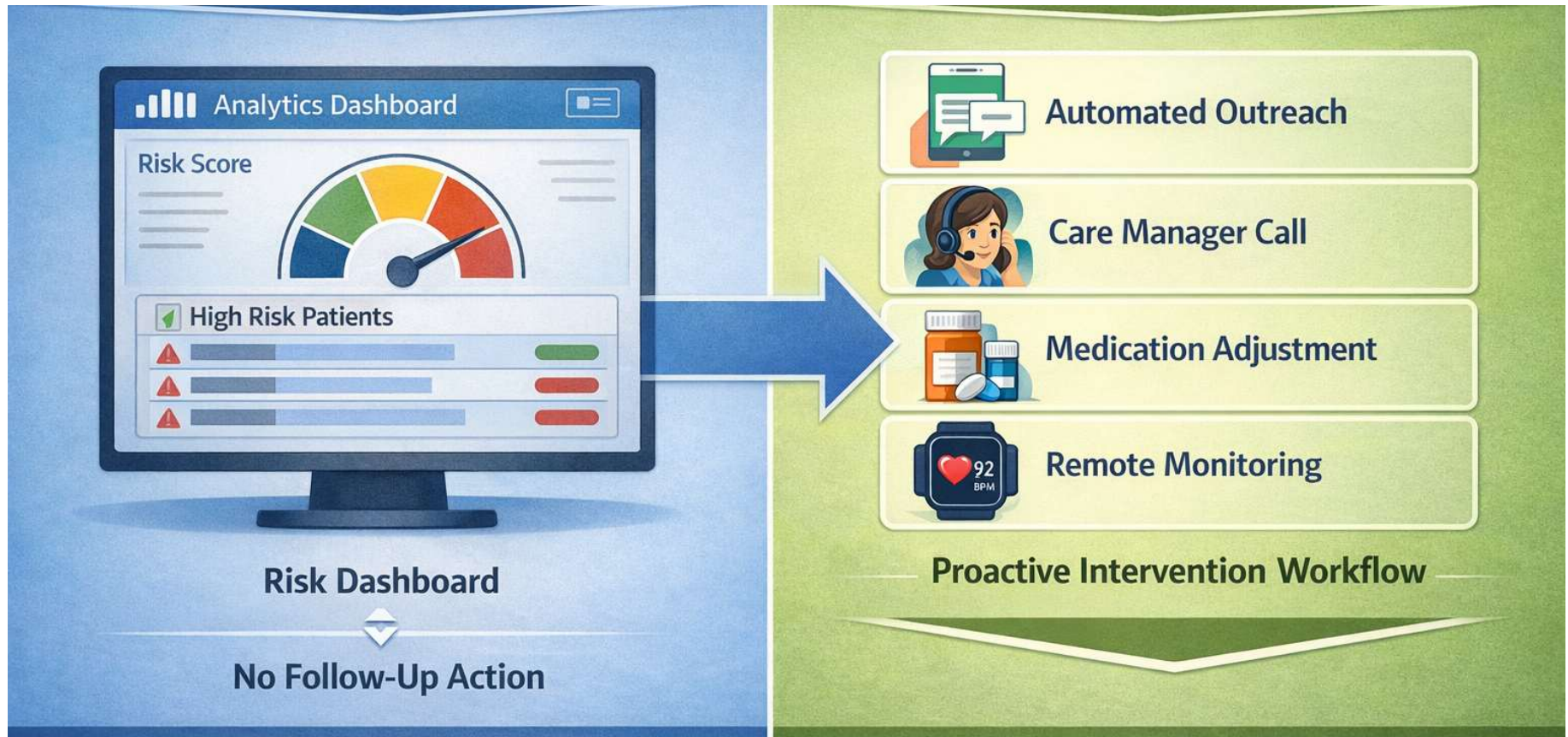
1. Claims
2. EHR
3. Remote monitoring
4. Patient feedback
5. Unsure

# Predictive Risk Scoring

- 1. Data signals are collected**  
Clinical indicators, medication adherence, symptoms, and social factors are continuously gathered from multiple sources.
- 2. Predictive models analyze patterns**  
Machine learning and statistical models identify patterns associated with increased ED risk.
- 3. Risk probability is calculated**  
Each patient receives a **dynamic ED risk score** and estimated probability of hospitalization or emergency utilization.
- 4. Care teams receive prioritized alerts**  
Patients with the highest predicted risk are surfaced for early intervention.



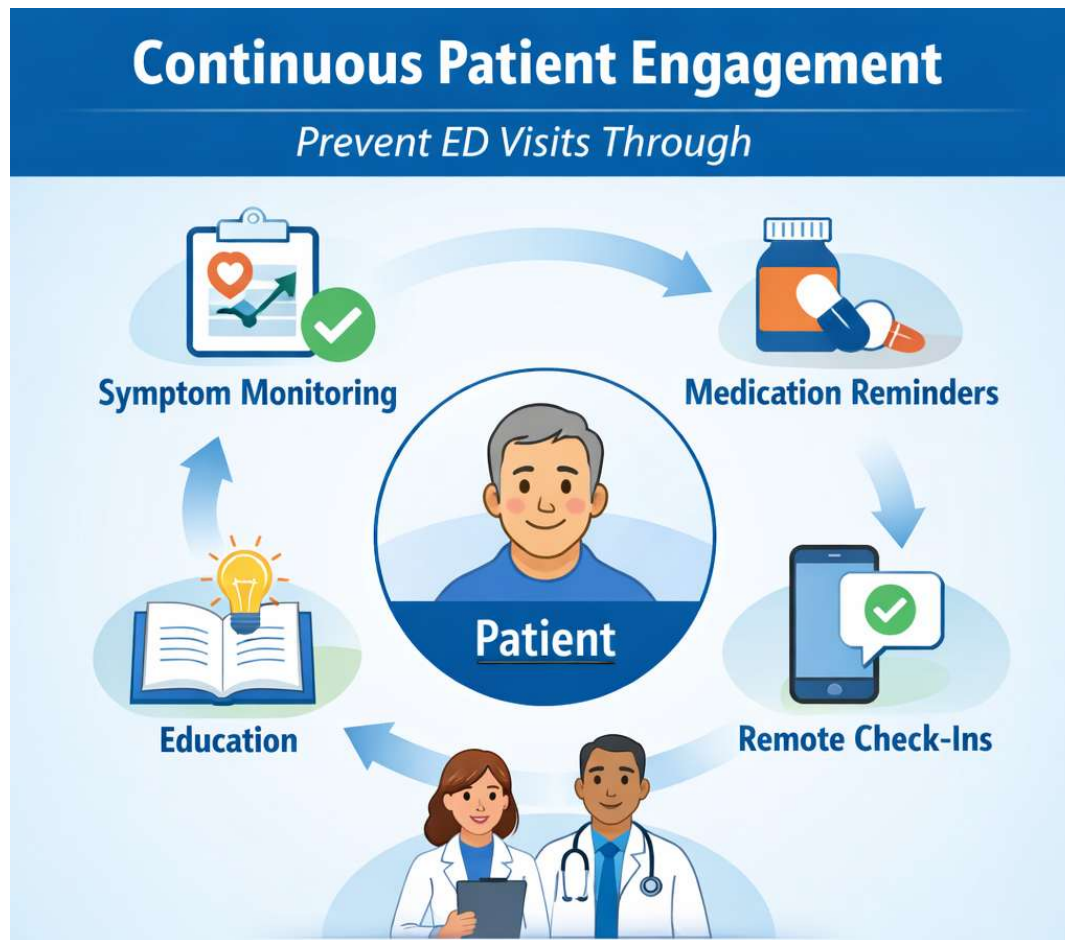
# Predictive Analytics Isn't Enough



# Reduce ED Visits Through Automated Patient Pathways

Continuous, automated engagement between visits helps detect problems early and stabilize patients before emergency care is needed.

And with the right digital automation platform, you don't need to hire extra staff.



# Digital Care Pathways

Digital care pathways translate predictive insights into continuous patient guidance, helping stabilize conditions and reduce emergency utilization.



# Early Intervention Workflow



*Early intervention workflows transform predictive alerts into coordinated care actions that stabilize patients before an ED visit occurs.*

## Poll Question 3

*How automated is your patient engagement between visits?*

1. Fully automated
2. Hybrid
3. Mostly manual outreach
4. Minimal engagement

# Financial Consequences of ED Visits

Many ED visits are driven by non-critical conditions that could be treated earlier in lower-cost settings.

Common conditions driving avoidable ED visits

- Bronchitis
- Cough
- Dizziness
- Flu
- Headache
- Low back pain
- Nausea
- Sore throat



# Financial Benefits of ED Reduction



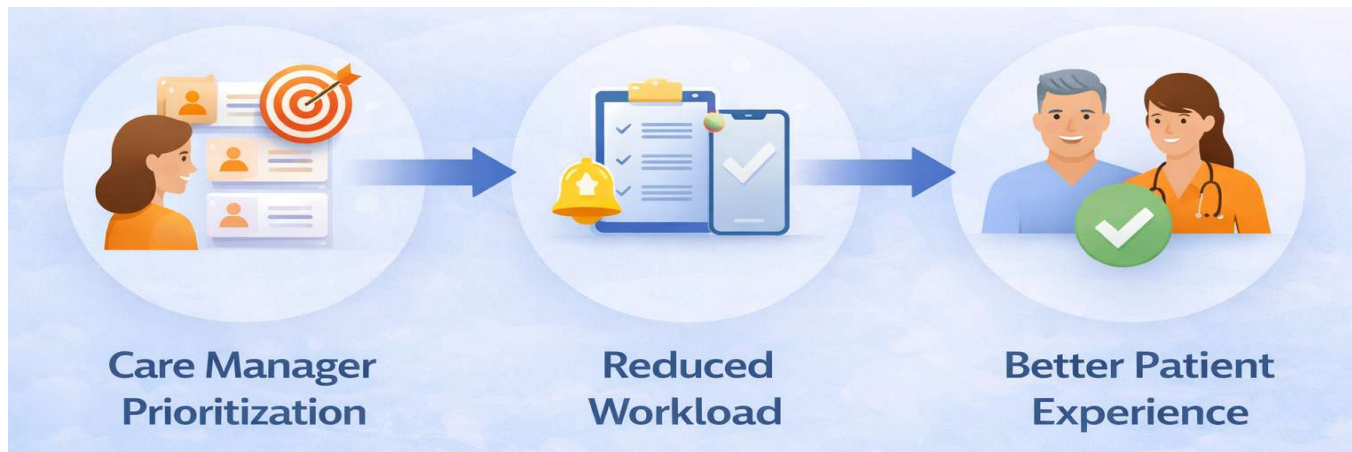
## Improve shared savings performance

Lower utilization helps provider organizations outperform cost benchmarks in programs such as MSSP ACOs and Medicare Advantage.

## Reduce downside risk exposure

Stabilizing patients earlier helps reduce cost volatility and protects providers from financial penalties in risk-based contracts.

# Operational Benefits of ED Reduction



Predictive analytics enables care teams to move from reactive outreach to proactive, prioritized care management.

## **Improve care manager prioritization**

Risk scoring helps care teams focus on the patients most likely to deteriorate, ensuring limited resources are directed where they can have the greatest impact.

## **Reduce care management workload**

Automated monitoring, alerts, and digital engagement reduce manual chart reviews and repetitive outreach tasks.

## **Improve patient satisfaction**

Patients receive proactive support, education, and timely interventions that help them stay healthier and avoid emergency care.

# Key Elements for Successful ED Predictive Prevention

Reducing avoidable ED visits requires more than analytics alone — it requires a coordinated system that connects data, prediction, engagement, and care delivery.



## Poll Question 4

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*Where is your organization today on predictive ED prevention?*

1. Reactive
2. Basic risk stratification
3. Emerging predictive analytics
4. Advanced predictive care

# PulseDataAI

Buy, Build, Partner: Flexible Engagement Models



## Off-the-Shelf Models

- ✓ Pre-trained, validated models for common chronic risks.
- ✓ Deploy immediately to identify high-risk members without development delays.
- ✓ Fine tune models with expert support



## Custom Developed Models

- ✓ Models tailored specifically to your population
- ✓ Unique data features, and internal KPIs.
- ✓ Collaborative development process.
- ✓ Partnerships that combine analytics with care delivery



## Action Pathway Library

- ✓ Evidence-based "next steps" mapped to risk signals.
- ✓ Don't just predict risk—know exactly how to intervene clinically.



## Platform Access

- ✓ Leverage PulseData's ML/AI infrastructure (Aorta) with your own data science team to accelerate internal innovation.
- ✓ Build models using our platform with guided expert support as needed.



## Model Analysis

- ✓ Independent benchmarking and analysis of your internal models to identify drift, bias, or performance gaps.

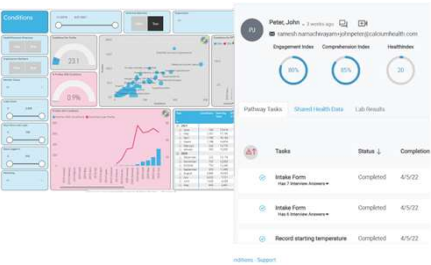
# The Calcium Platform

For Organizations



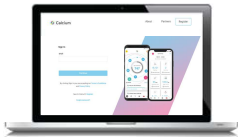
## Calcium Core

Robust analytics and trends, AI, and insights, plus patient management and alerts



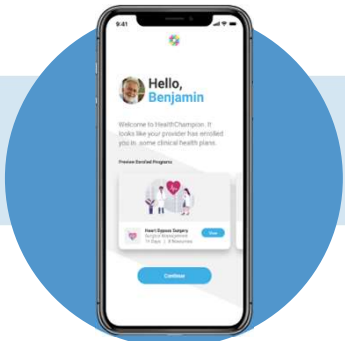
## Calcium AI Studio

Modify and create pathways to engage your patients, employees and more



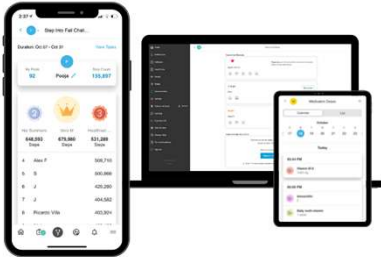
Easily sign-in to Calcium Core and Calcium Studio via desktop browser.

For Individuals



## Calcium App






Patient-facing health Super App to deliver your pathways and more  
(Available in Google Play, Apple App Store; on Mobile, Desktop and Tablet)



# Q&A

# Key Takeaways

## Key Takeaways

-  • Many ED visits are predictable
-  • Early identification enables intervention
-  • Predictive analytics prioritizes care teams
-  • Continuous patient engagement prevents deterioration
-  • ED reduction improves VBC financial performance

Stop by our VBCExhibitHall.com Virtual Booth:



[Visit the Calcium Health exhibit booth](#)

# Contact Information & Follow-Up

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