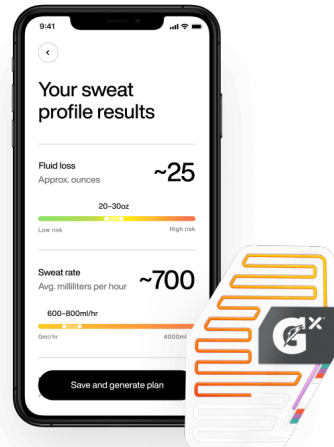




Protecting Workers from Heat Injury with Wearable Technology

Epicore Biosystems

Products

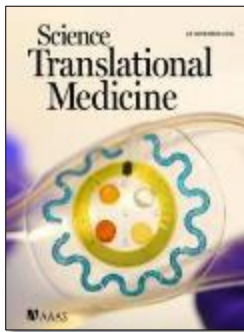


Gx Sweat Patch (single use)



Connected Hydration (continuous)

Expertise



30 issued / allowed patents
40+ Peer-reviewed publications

[Click to Read](#)

Investors



Research Partners



NORTHWESTERN UNIVERSITY

Massachusetts Institute of Technology

Climate Change is Hitting Workers and the Economy Hard

Heat has large macro safety & economic impact

\$500B heat-related **labor-productivity losses** projected annually by 2050 ⁽¹⁾

3% loss in efficiency and **1%** increase in injuries per **1° C** temp rise ^(2,3)

50+ more high heat days per year by 2050 ⁽⁴⁾

Heat injuries & illnesses likely very underreported

40x more deaths caused by heat estimated than reported by OSHA ^(5,6)

50x more injuries caused by heat estimated than reported ^(5,6)

Heat **reduces cognitive performance** and negatively influences decision making ^(7,8)

Dehydration is a significant factor in Heat Injuries

2% body weight loss in fluid leads to cognitive impairment ⁽⁹⁾

10x range of sodium concentration between individuals ⁽¹⁰⁾

Consecutive workdays in high heat **can further increase the risk of heat illness** ⁽¹¹⁾

Personalized hydration can decrease risk & costs

\$79K cost of a single labor heat injury ⁽¹²⁾

30% reduction in CA heat injuries after heat standard implemented, non-personalized ⁽¹³⁾

Proper hydration helps mitigate the effect of heat exposure ^(14,15,16)

(1) Atlantic Council 2021
(2) University of Chicago
(3) Syeda et al, 17 study meta-analysis
(4) Reidmiller et al

(5) Public Citizen 2022
(6) Institute of Labor Economics, 2021
(7) Graff Zivin et al. 2017
(8) Heyes and Saberian, 2019

(9) Chevront et al 2016
(10) Gatorade Sports Science Institute
(11) Notley et al 2018

(12) OSHA cost estimator
(13) Park et al 2021
(14) Armstrong et al. 1985
(15) Gonzalez-Alonoso et al. 1997
(16) Gopinathan et al. 1988



EPICORE
BIOSYSTEMS

Connected Hydration

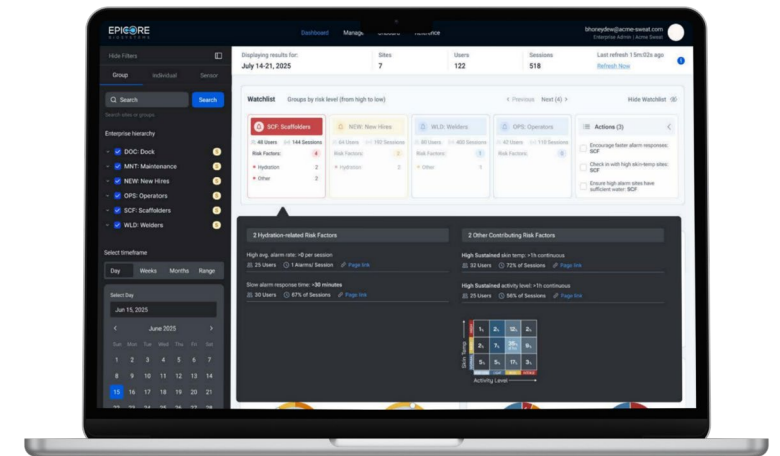
Intrinsically safe wearable **empowering Industrial Athletes** through rehydration recommendations & haptic interventions. Designed for low / no connectivity environments.

Stay Hydrated. Stay Safe.

Worker App



Wearable
(with armband)



Enterprise Cloud &
Reporting



One Size Does Not Fit All



10.7oz
Fluid Loss

17.1oz
Fluid Loss

8.3oz
Fluid Loss

29.9oz
Fluid Loss



689mg
Sodium Loss

1270mg
Sodium Loss

590mg
Sodium Loss

3185mg
Sodium Loss



☀️ Same Heat Index

📍 Same Location

💪 Same Level of Exertion

💧 **22x** range in sweat loss⁽¹⁾

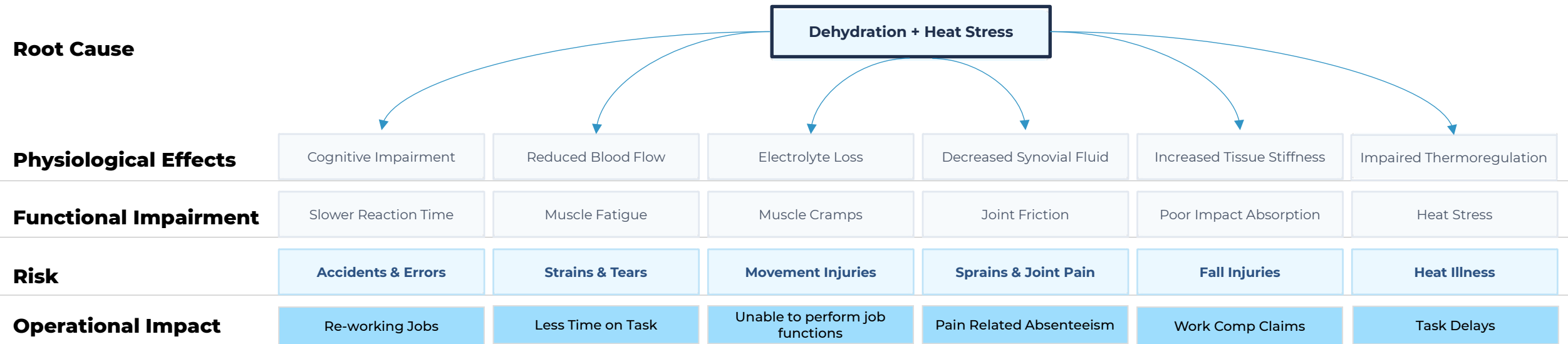
🧂 **15x** range in sodium loss⁽¹⁾

Many factors affect sweat loss

- Acclimatization status
- Hydration state
- Fitness level
- Body mass
- Dietary habits
- Alcohol consumption
- Workload strain
- PPE and athletics gear
- Temp & humidity
- Sleep and stress levels

(1) Baker et al 2016

The Performance Degradation Pathway



Managing Fatigue with Connected Hydration

WHAT YOU MEASURE



Body Mass Loss (BML) %
 Skin Temperature Rise
 Activity/Motion Index
 Fluid Loss Rate

→ All in real-time, per worker

WHAT YOU MANAGE



Dehydration before cognitive decline
 Heat strain before heat illness
 Fatigue before errors occur
 Individual worker readiness

→ Leading indicators, not lagging

WHAT YOU PROVE



Reduced deviation rates
 Lower near-miss frequency
 Improved throughput stability
 Defensible fatigue control program

→ Operational + Safety ROI

Connected Hydration Measures Sweat Loss Directly

First-ever **personalized** hydration management solution providing:



Direct, continuous monitoring of sweat loss & electrolyte concentration



On-body hydration reminders



On-body dehydration alarm



Skin & under-PPE temp



Activity level



Designed for Tough Environments

Technical specifications:



**Intrinsically Safe
(Class 1, Div 2)**



**1,000+ hours battery life
(no recharging needed)**



**On-board memory
(no data connection needed)**



SOC 2 Type II compliant cloud



**Tested in hot environments
up to 65° C**



Deployed Globally by Chevron

Chevron and Epicore have signed a three-year agreement to deploy Epicore's Connected Hydration system to protect workers at upstream, midstream and downstream sites across the globe.

Connected Hydration Armband

Built to Scale

- Reusable, washable form factor
- Enables consistent wear across crews
- Designed for sustained adoption at scale

BENEFITS:

- Higher adoption
- Lower operational overhead



Worker Benefits

Proactive Coaching That Builds Safer Hydration Habits

- Reduce cognitive-risk windows during long, heat exposed shifts
- Support consistent hydration behaviors
- Maintain focus, reaction time, and task accuracy

Armband Use:

On-body haptic alarms

Real-time sweat analysis (on device)

Hydration logging (big button)

CH App Use:

Personal hydration insights

Behavior trends

Team performance



Outcome: Fewer cognitive slips → Safer execution → Sustained performance.

Connected Hydration App

Workers receive real-time hydration insights that help them manage heat, fatigue, and focus throughout the day.

What workers experience:

- On-body vibration alerts
- Clear visibility into hydration and electrolyte loss
- Personal trends that build awareness over time

Worker outcomes:

- **Build hydration habits**
- **Replace what you lose**
- **Stay sharp and reduce risk**



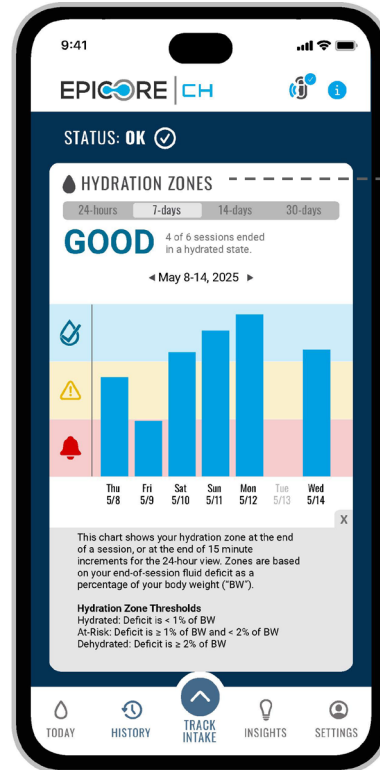
Connected Hydration App

Daily guidance

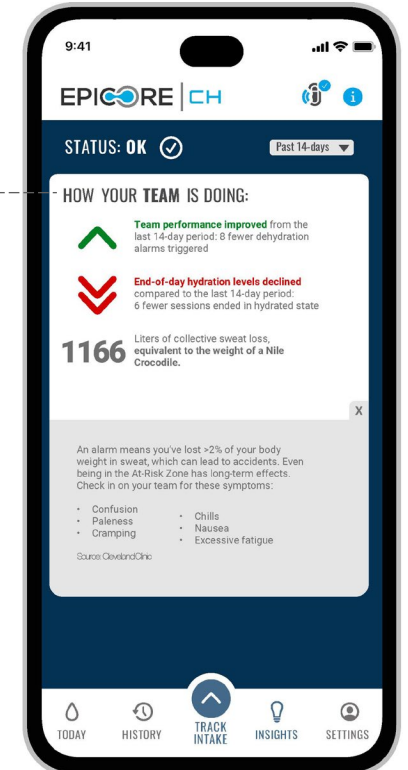


Gamified behavior score

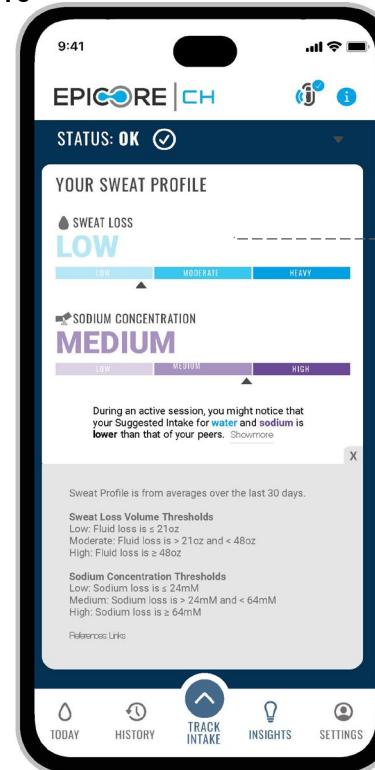
Personal hydration trends & insight



Team performance visibility



Sweat profile awareness



Hydration Alerts – What are they?

- The device has 2 types of hydration alerts - felt as a vibration on the arm
 - Short buzz – every 500mL you lose
 - Long buzz – at 2% body mass net loss 
- Alerts are **only on-body** and **personal to you** – they are not sent to supervisors!



**HYDRATION
ALERTS**

Recommended Intake

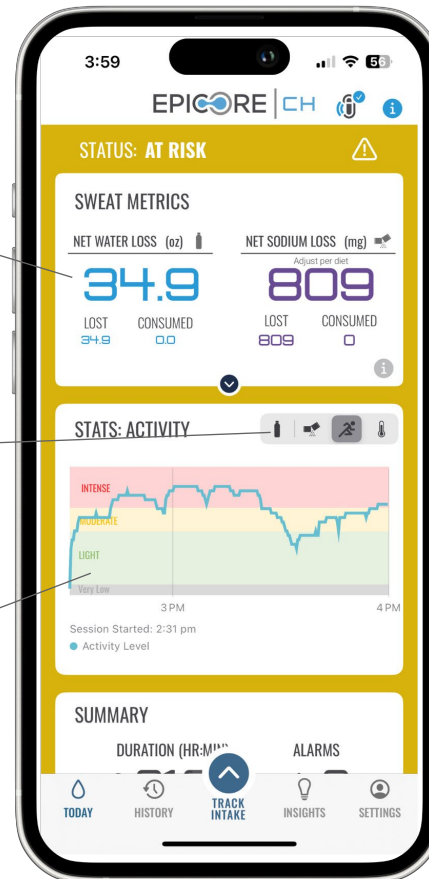
Fluid oz
Sodium mg

Sweat / Intake Curve

Gamified hydration tracking

Multimodal sensing features

Sweat & Electrolyte loss
Skin Temperature
Motion / Exertion
Heat Index + forecast



**HYDRATION
INSIGHTS**



2% fluid loss for a 200lb person is just 2 liters – an amount easily lost within just 1 to 2 hours of physical labor.

Smartphone Connection

Without Phone

On-Body Alarms and Alerts

- Vibration alarm when sweat loss reaches 500ml
- Intense vibration alert when sweat loss exceeds 2% of body weight
- Press large button when you have drunk a bottle (500ml) of water
- Sync to smartphone during breaks or at end of shift



Simple, actionable feedback without a phone

With Phone

Additional Details

- Detailed display of fluid and sodium loss
- Graphical display of today's hydration trends
- Access to complete history
- Data synced continuously



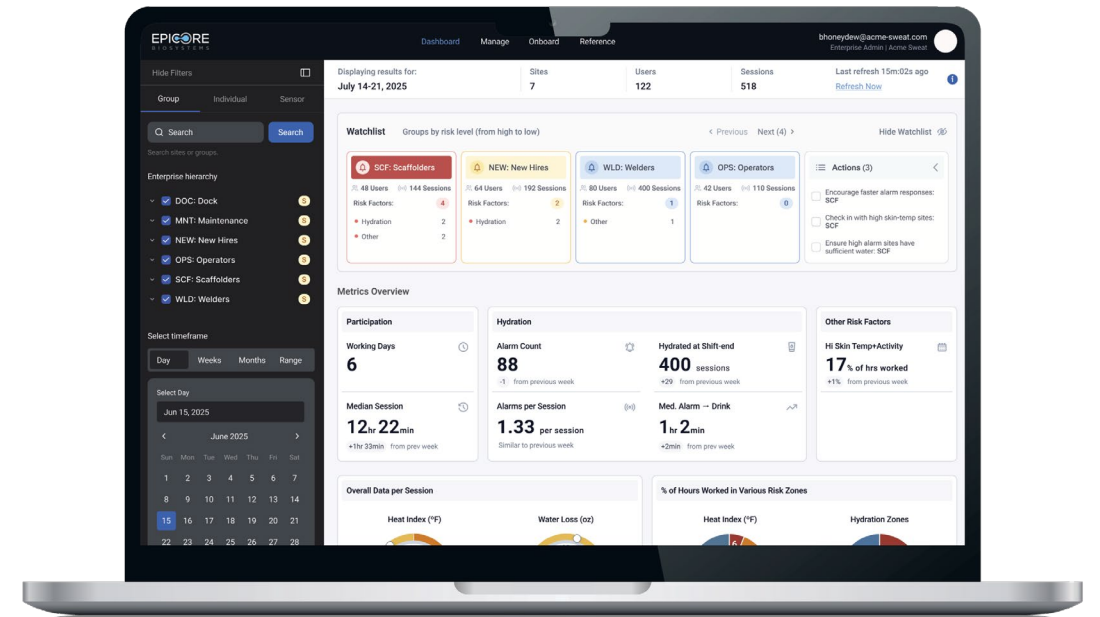
Smartphone insights encourage behavior change

Connected Hydration Cloud

Analytics That Accelerate Action

Updated CH Cloud:

- Reduces interpretation burden
- Highlights high risk groups
- View trends over time
- Built in education and context
- Anonymized, role-based access



Outcome – Faster and more confident safety and operational decisions

CH Cloud Evolution

Displaying results for: July 14-21, 2025

Sites: 7 Users: 122 Sessions: 518 Last refresh 15m:02s ago [Refresh Now](#)

Watchlist Groups by risk level (from high to low) < Previous Next (4) > Hide Watchlist

SCF: Scaffolders

48 Users 144 Sessions

Risk Factors: **4**

- Hydration: 2
- Other: 2

NEW: New Hires

64 Users 192 Sessions

Risk Factors: **2**

- Hydration: 2

WLD: Welders

80 Users 400 Sessions

Risk Factors: **1**

- Other: 1

OPS: Operators

42 Users 110 Sessions

Risk Factors: **0**

Actions (3)

- Encourage faster alarm responses: SCF
- Check in with high skin-temp sites: SCF
- Ensure high alarm sites have sufficient water: SCF

2 Hydration-related Risk Factors

High avg. alarm rate: >0 per session
 25 Users 1 Alarms/ Session [Page link](#)

Slow alarm response time: >30 minutes
 30 Users 67% of Sessions [Page link](#)

2 Other Contributing Risk Factors

High Sustained skin temp: >1h continuous
 32 Users 72% of Sessions [Page link](#)

High Sustained activity level: >1h continuous
 25 Users 56% of Sessions [Page link](#)

Skin Temp	High	1%	2%	12%	2%
	Normal	2%	7%	35% of hrs	9%
	Low	5%	5%	17%	3%
		Low	Light	High	Intense
		Activity Level			

Risk factor details

Risky groups watchlist

Contributing factor details

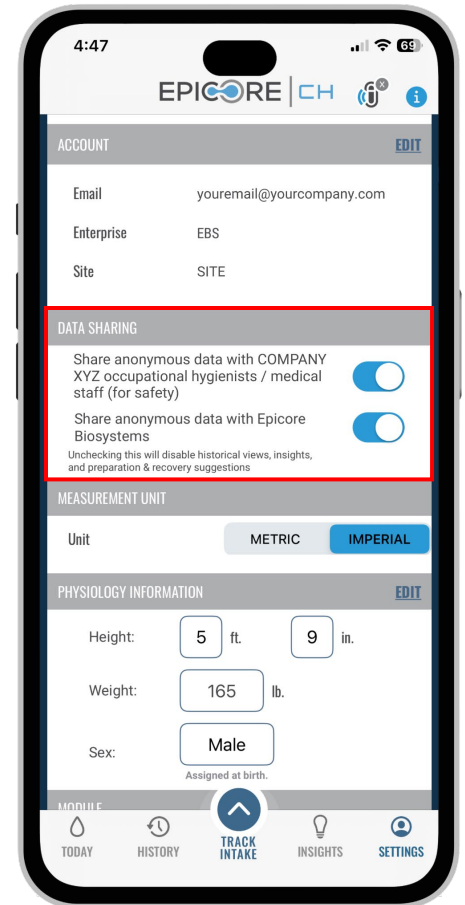
You Control Your Data

Epicore is built to put workers in control. Hydration data is first and foremost for the person wearing the device.

What this means:

- Workers see and use their own hydration data
- Workers choose whether anonymized data is shared with the company
- Sharing preferences can be changed at any time

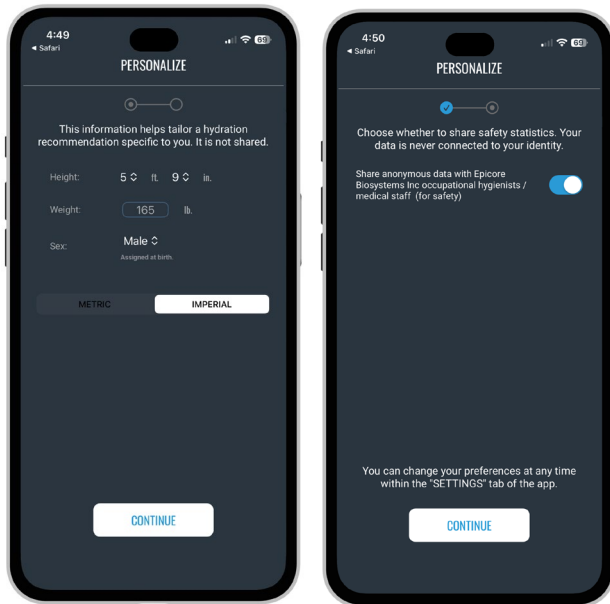
This system is designed to **empower workers with insight** into their own bodies, **not to monitor or punish**.



Data Flow

- Workers **control all personal data** and where it goes.
- Only **anonymized data is shared with the company** – it cannot be traced back to a name.

Step 1 – Onboarding



- Worker enters **height, weight and sex**
- Worker **chooses to share anonymized data** with their HSE/IH team and Epicore

Step 2 – Device usage



- On-body alarms
- **Sweat and Sodium loss**
- Skin temperature and activity levels
- Hydration logging (large button)


- Personal **hydration insights**
- Hydration logging (ex: electrolyte beverages)

- **Anonymized** cloud analytics (HSE facing)
- Individual worker data **is not visible**

Keeping Data Safe

Epicore is built with privacy, security and transparency as core principles.

Key protections:

- Worker-controlled data sharing
- Anonymized and aggregated reporting by default 
- Enterprise-grade security (SOC 2 Type II)



For full details on data handling, consent, and security practices, refer to Epicore's [Privacy Policy](#).



Epicore does offer a de-anonymized mode where worker names are visible.

THIS CAN ONLY BE ENABLED WITH EXPLICIT APPROVAL FROM THE WORKERS.

Proven Value

"I used to have some cramping and even vomiting, I didn't really have any of that this time."



Field Worker,
Major Construction
Company

"Wearing this made me more aware of my personal needs. Now I follow the recommendations I cramp less & feel better"



Confined Space Worker,
Major Energy Company

"It just works—I've had other sensors for 0 years that I've never been able to get working properly [these things were good on day one—"



HSE Director,
Chemical Refinery

"In our eyes [this is a proven technology—I can see it becoming standard PPE—"



HSE Executive,
Fortune 50 Company

Epicore vs. Other Wearables



Direct Hydration Measurements



Leading indicators of fatigue, dehydration and heat stress.

Fluid loss
Electrolyte loss



Activity and skin temperature metrics provide **contextualized data**

Microfluidics create a controlled, stable analysis of sweat dynamics

Rehydration, performance, & behavioral feedback

Other Wearables

Indirect Hydration Measurements



Lagging indicators of physiological decline.

Heart rate
Respiration rate



PPG, HR, and Temp are indirectly related to rehydration feedback

HR has a **delay with heat correlation**
Wrist is noisy location to assess temp

Indirect, late-stage reactive feedback



Website

<https://epicorebiosystems.com>

Slide Deck

<https://epcr.cc/deck>

Email

sales@epicorebiosystems.com

Schedule a Call

<https://epcr.cc/demo>

