

When the Health score crashes, is the body warning us?

A member watched her Health score fall from 100% to 20% and asked whether it signals a coming crash. Following that question led through our community data, into the algorithm's source code, and out into the autonomic-nervous-system literature. This is the trail.

Can a sharp drop in the Health score — for example from around 100% to 20% — serve as a signal of elevated physiological stress? The app often interprets a drop like this as a sign of getting sick — does the literature or observational data suggest it may also correlate with an oncoming crash (post-exertional collapse)?

*Prepared 2026-06-10 · R&D analysis · Women with PEM (Long COVID / ME/CFS / fibro / POTS)
Health score is per-user normalized — never compared across people*

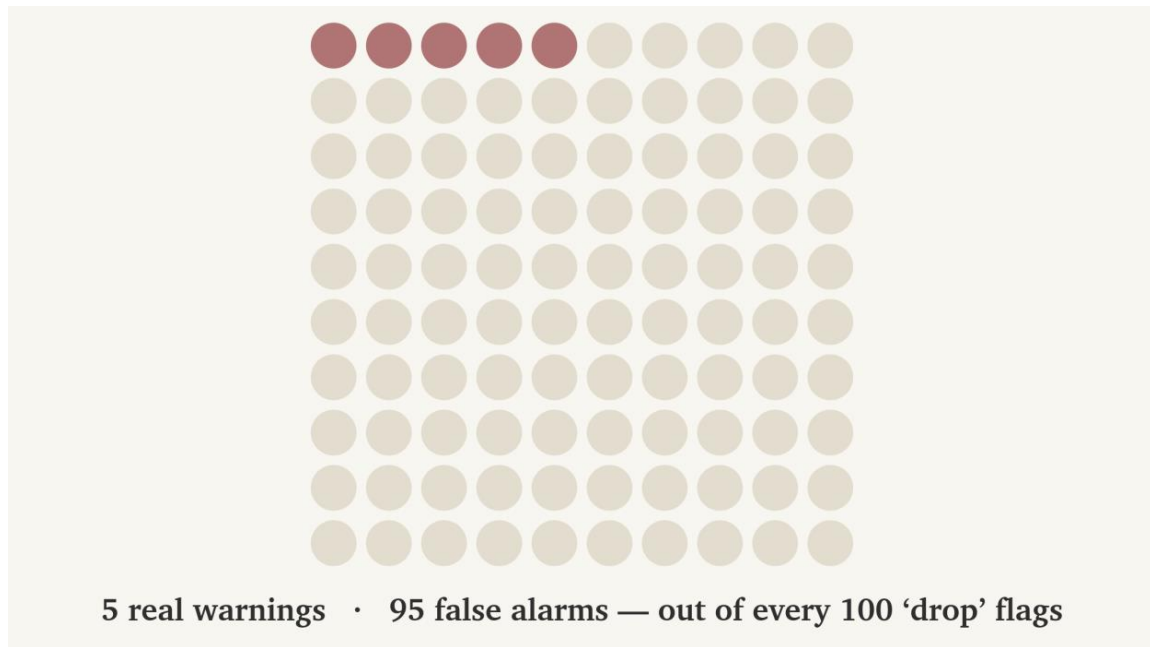
THE SHORT VERSION

If you only have energy for one page

A drop in your Health score is a mirror of how your body is doing right now — not a reliable warning that a crash is coming. It is the metric working as designed: an early illness detector. In PEM, being “off” from your healthy baseline is so common that the alarm is true almost every day.

As a warning ahead of a crash, it is mostly false alarms. In our community a drop fires on about 1 day in 4, and is actually followed by a crash only about 5% of the time. It does not fall sharply *before* a crash — it sits low throughout.

What did come before crashes more reliably was a spike in activity the day before. And your own sense of feeling off carried the clearest signal on the day itself.

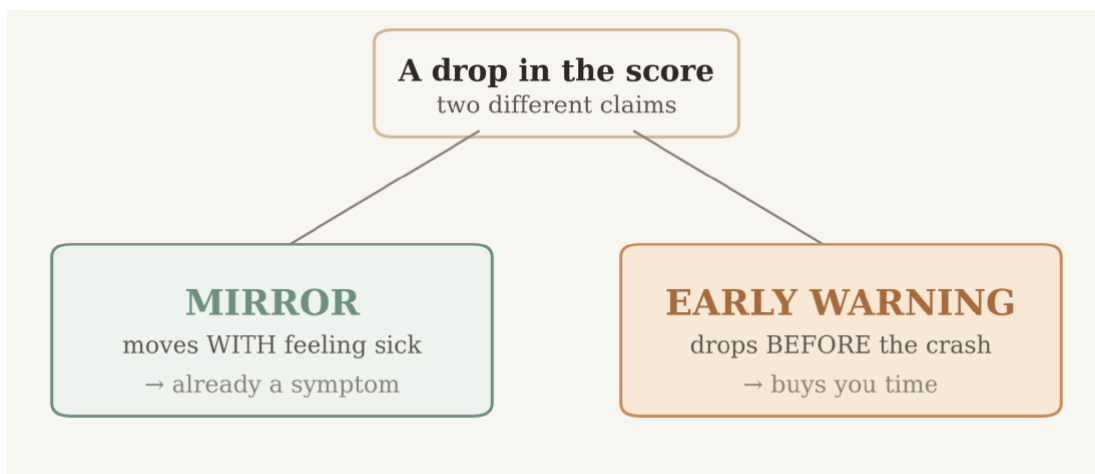


The rest of this note shows how we got here. Read whichever parts you have energy for, and skip the rest.

STEP 1 · SPLIT THE QUESTION

“Warning” and “mirror” are not the same claim

The question quietly bundles two ideas. A number that only drops once a person *already* feels sick is a mirror of the present. A real warning would drop *before* the feeling — early enough to act. Everything downstream depends on telling these apart, with the PEM lag of 24–72 hours in mind.

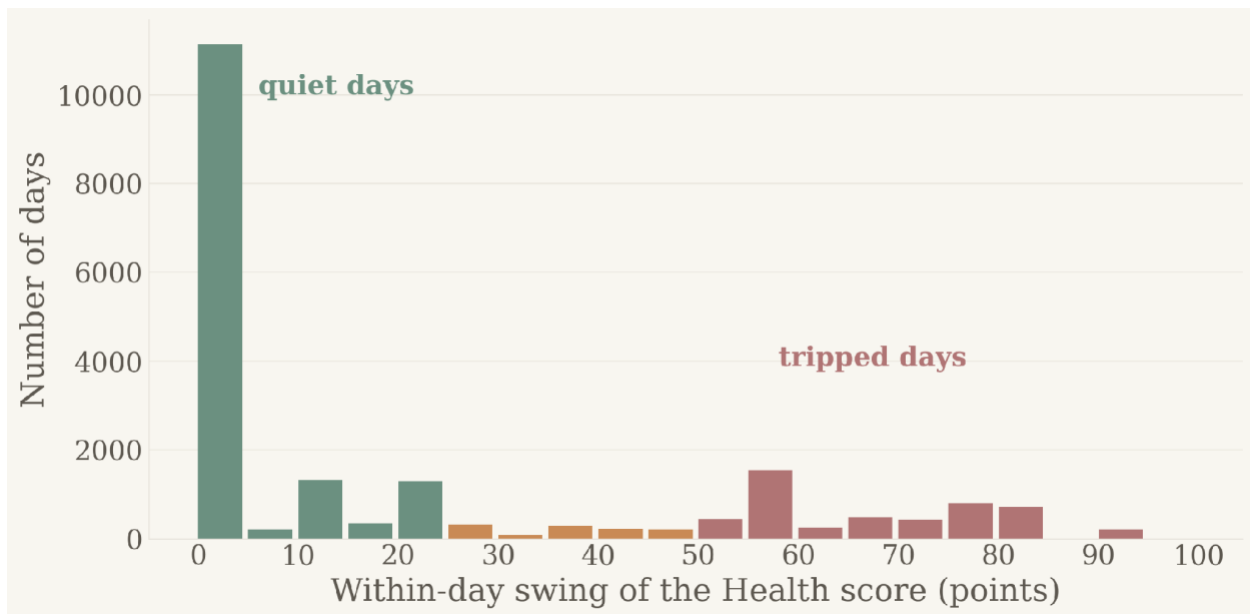


The same drop can be either thing. The whole investigation is about which one it actually is.

STEP 2 · WATCH THE NUMBER MOVE

It behaves like a switch, not a dial

Across 84 members and 20,324 days, the dramatic swing is real: 24.1% of days swing by 50+ points. But the number does not glide. On half of all multi-measurement days it does not move at all, then it jumps — quiet, or tripped.

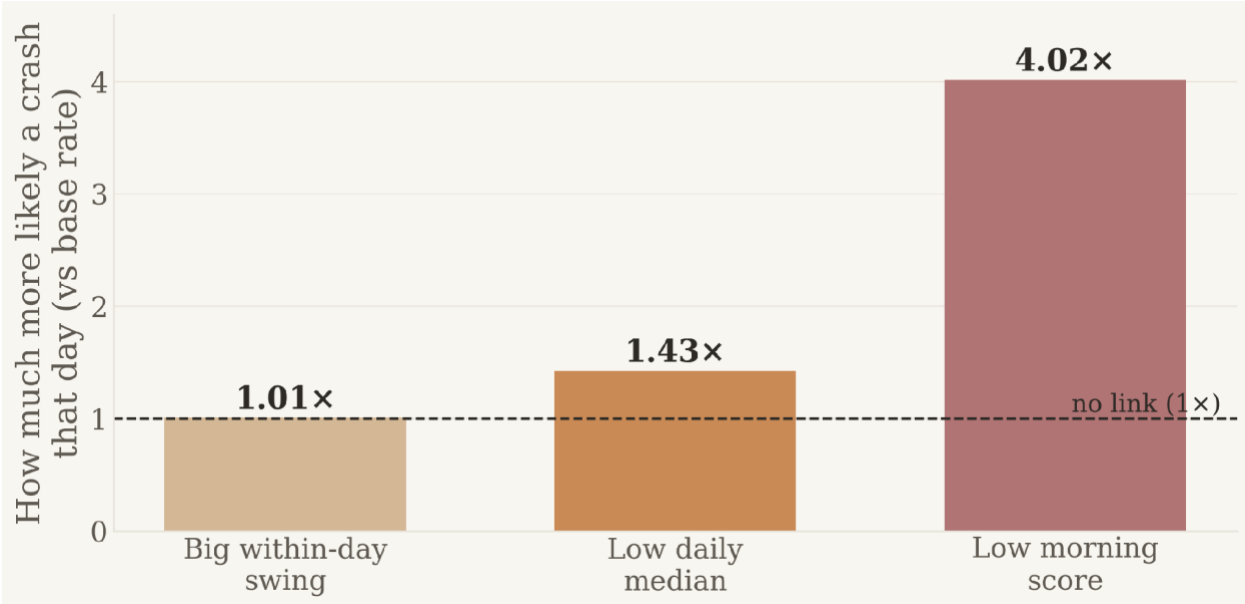


Within-day swing of the Health score. A pile at zero (quiet days) and a second cluster at 50–75 points (tripped days) — little in between.

STEP 3 · DOES THE DROP MEAN ANYTHING?

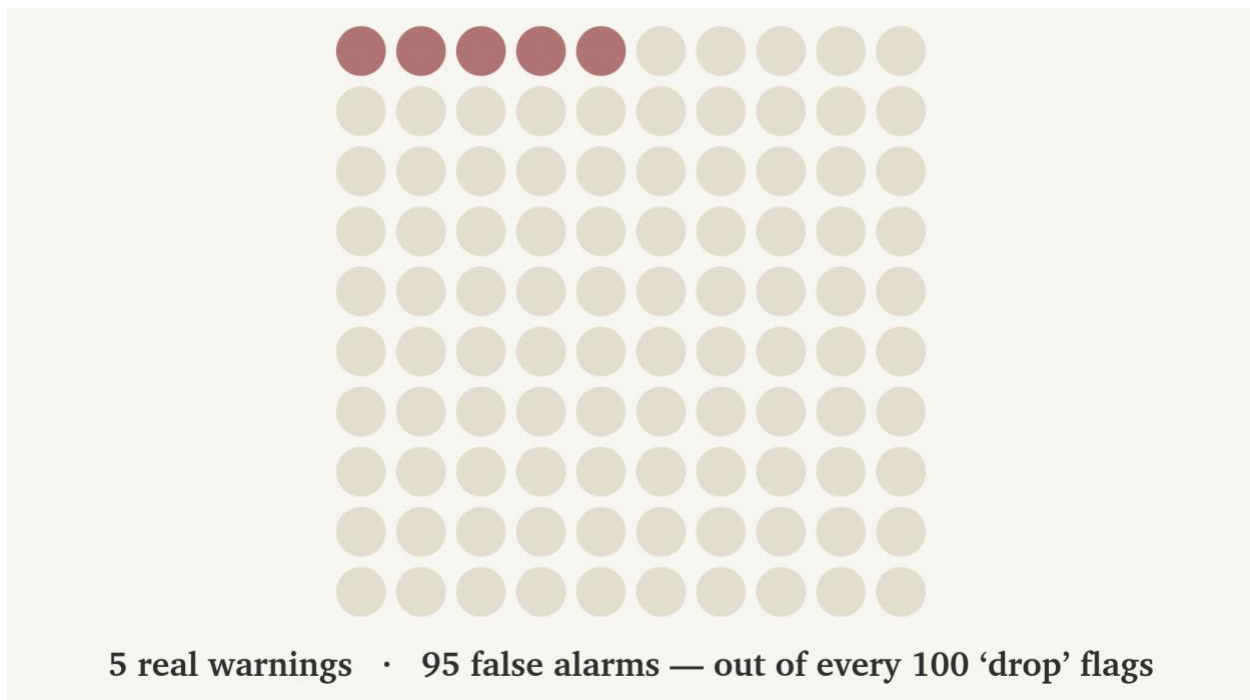
In our community, the drop is a mirror — and a noisy one

Three checks, all within-person, against each member's own baseline. First: does the swing line up with a crash that day. The big swing itself has essentially no link (1.01×). What does line up is a low *level*, especially the daily morning score.



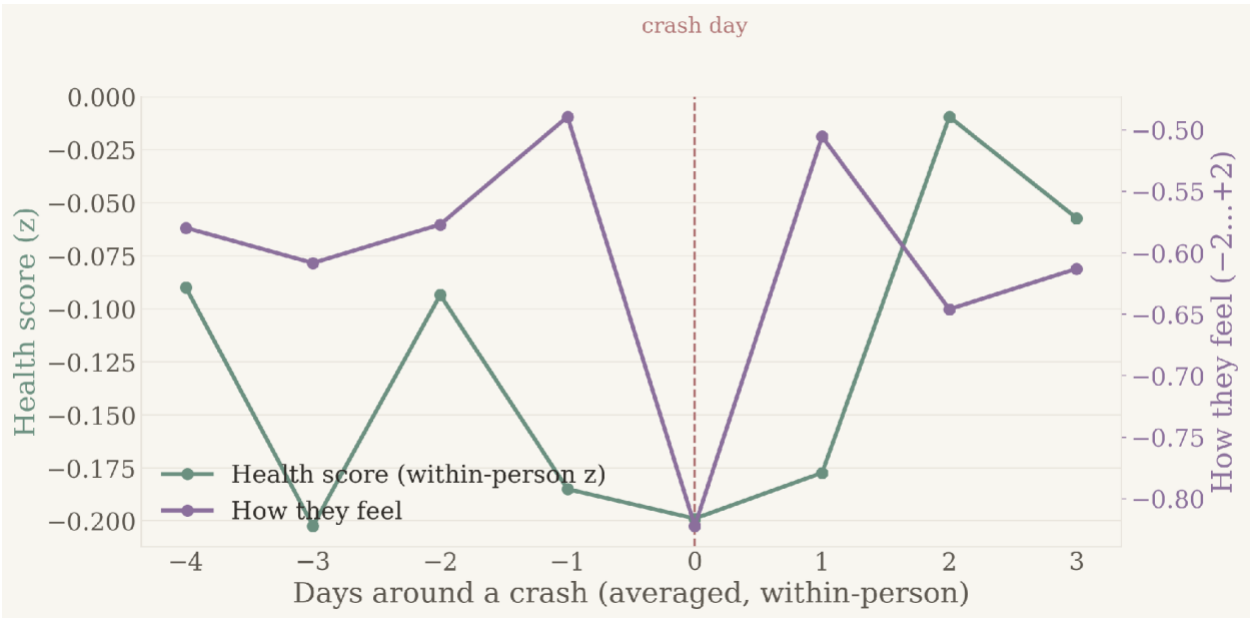
How much more likely a crash is on a flagged day. The swing the member describes: no link. Being low: a real co-occurrence.

Second: does the swing track how she feels. Barely — the within-person correlation with self-reported wellbeing is $\rho \approx +0.01$, essentially zero. Third, and the real question: does it warn ahead. When a swing fires in the 1–3 days before a crash, it is right only about 5% of the time. It fires on a quarter of all days, so it “catches” crashes only by crying wolf constantly.



Out of every 100 “drop” warnings, roughly 5 are actually followed by a crash. The rest are false alarms.

Lining up every crash tells the same story: the score sits in a shallow dip the whole time — it does not plunge sharply *before*. The cleaner signal is what people say; felt state drops hardest on the crash day itself.



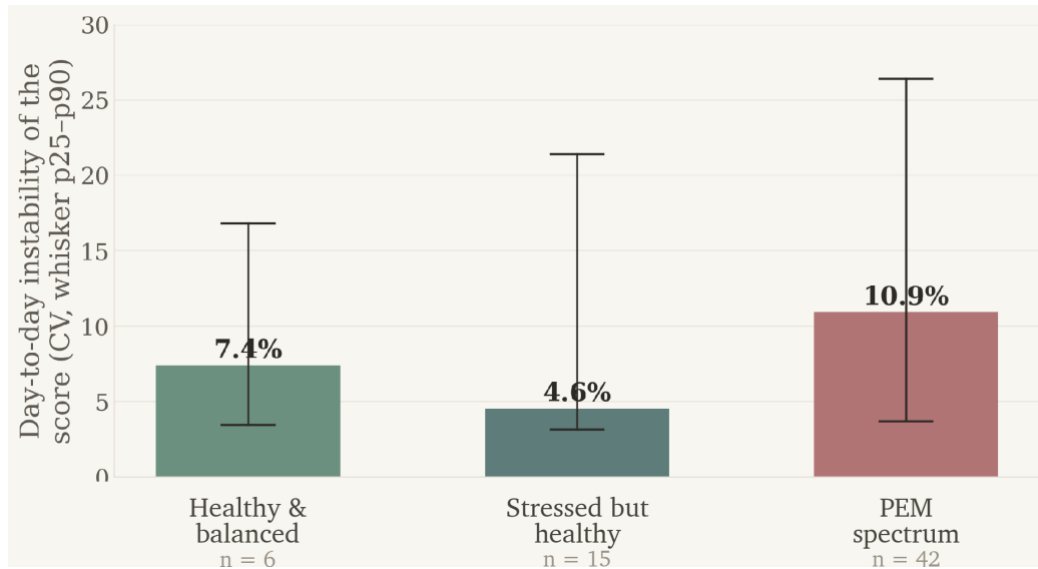
Averaged across crashes. The score (green) is mildly low throughout — no sharp pre-crash plunge. Felt state (plum) dips hardest on the day.

STEP 4 · STEP BACK — WHAT IS THIS NUMBER?

It was built to stay flat in healthy people

If the drop is not forecasting crashes, what is it doing. Across 97 reference users the score sits at a median of 94/100 and barely moves. People who are stressed and anxious but not chronically ill stay the most stable of all. Stress does not move this number. Illness does.

94 population median (near ceiling)	4.6% instability — stressed-healthy	10.9% instability — PEM spectrum	4× more big drops in PEM
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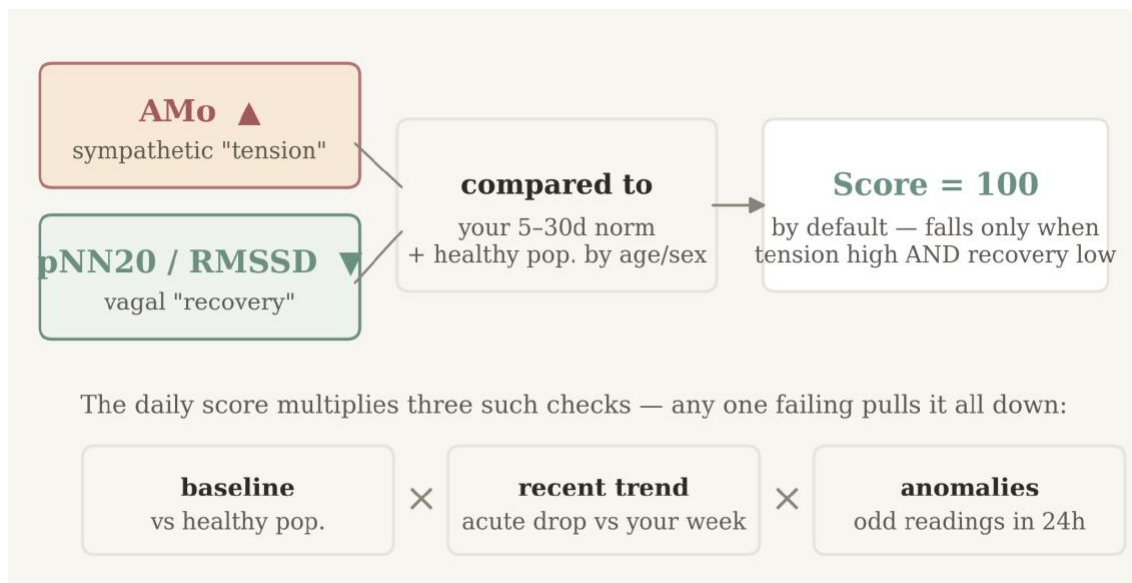


Day-to-day instability of the score by group (whisker p25–p90). Stress keeps it flat; the PEM spectrum is 2–3× more volatile. Group sizes small — read as direction, not proof.

STEP 5 · OPEN THE BOX

What the score actually measures

The source code settles it. The number watches two things — how “tense” the heart rhythm is (a sympathetic marker, AMo) and how much “recovery” tone it carries (a vagal marker, pNN20 / RMSSD) — and grades them against both the person’s own recent norm and a healthy population norm for their age and sex. By default the answer is 100. It falls only when tension is high *and* recovery is low at once.

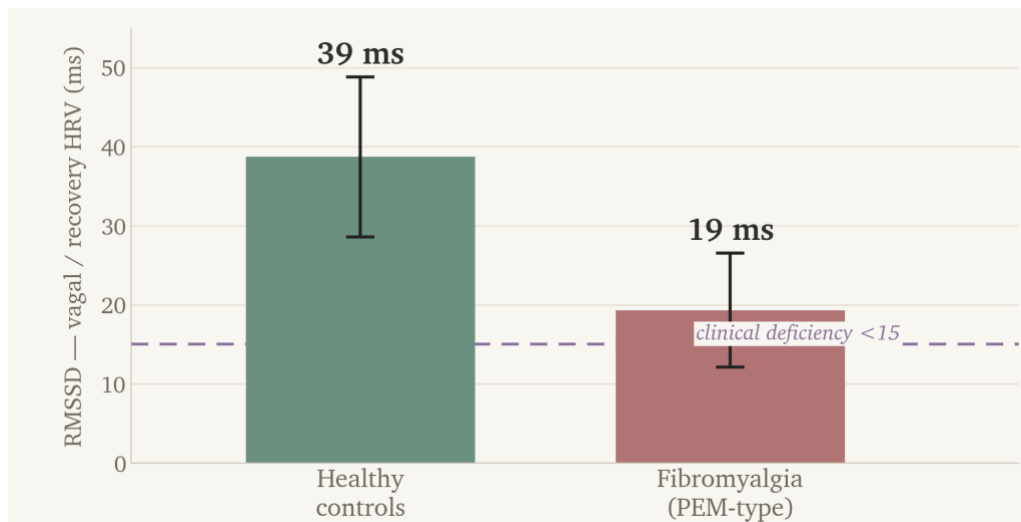


Simplified anatomy of the score. It is engineered to read “fine” unless the autonomics genuinely deviate from a healthy pattern.

STEP 6 · WHY PEM TRIPS IT CONSTANTLY

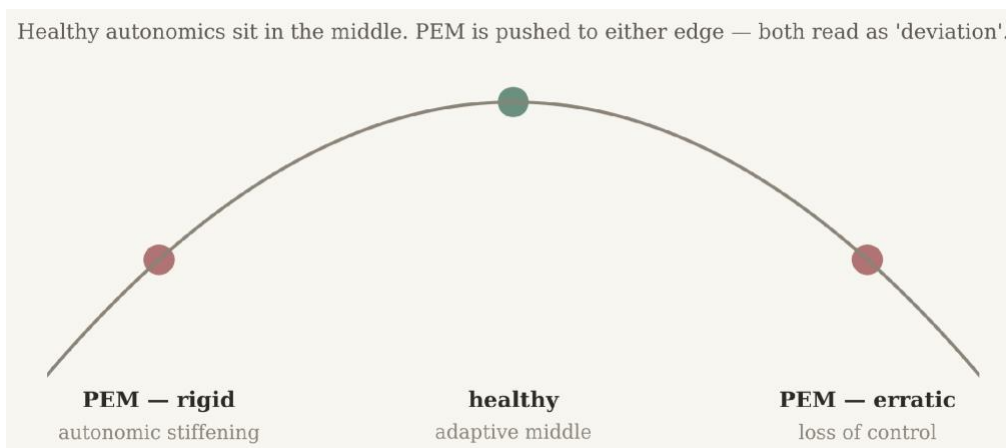
The detector is firing on real biology

PEM and related conditions hit exactly the two dials the score watches. Vagal recovery tone (RMSSD) is roughly halved versus healthy — in fibromyalgia it sits near the clinical-deficiency line.



From the literature: RMSSD in a PEM-type condition vs healthy controls. Healthy 38.7 ± 10.1 ms; fibromyalgia 19.3 ± 7.2 ms.

There is a deeper point. Healthy autonomies keep a *moderate* complexity — flexible, neither rigid nor chaotic. In PEM that adaptive middle is lost: the system either stiffens or lurches erratically. Both extremes register as “deviation”, which is exactly what trips the score’s trend and anomaly checks, over and over. In our own cohort this shows as lost complexity (entropy effect size -0.75) and autonomic rigidity ($+0.74$).



Healthy autonomies sit at the adaptive peak. PEM is pushed to either edge — both read as deviation.

What this means

So — is the drop a warning? In our community, no — not a useful one. But the drop is not noise either. The Health score is a faithful detector of the autonomies straying from a healthy baseline, and it is working correctly. The catch is that in PEM, straying from baseline *is* the baseline. The alarm is true almost every day, decoupled from how a person feels, so it cannot tell which off-day becomes a crash. It is a mirror of the present, not a forecast of tomorrow. What preceded crashes more reliably in our data was a spike in activity the day before — a steadier thing to watch than the number falling.

Evidence and limits

Community data: 84 members, 20,324 user-days, 149 crash episodes (per-measurement health_percent). Reference cohort: Welltory 10-personas handoff (100 users × ~89 days of the daily morning score). Algorithm: Welltory code (welltory_cardio_hrv). Physiology: internal research vault plus phenotyping benchmarks.

This is descriptive work on small groups; no inferential claims are made. The field has no validated condition-specific HRV norms for ME/CFS, Long COVID or POTS — the strongest quantitative anchor is fibromyalgia, so the claims rest on direction, not precise cut-offs. The Health score is normalized per user and is never compared between people.

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