

Wearable health metrics to measure for migraine prediction

This table comprises the most valuable wearable health metrics to measure for migraine prediction.

Metric	Motivation	References
Skin conductivity	Skin conductivity is a measure of the electrical conductivity of the skin, which can be affected by changes in skin temperature, hydration, and other factors. It has been shown to be a useful biomarker for migraine prediction, as changes in skin conductivity is highly correlated with stress and the onset of migraine	[1], [2], [3], [4]
Heart rate	Heart rate a measurement of the amount of heartbeats per time frame and is strongly correlated with the amount of stress of an individual. It has been shown to be a valuable metric in the analysis and prediction of onset of migraine	[2], [5], [6], [7], [4], [3]
Heart rate variability	Heart rate variability is a measurement of the variation in time between heartbeats and is a sensitive marker of autonomic balance. It has been shown to be a valuable metric of stress and thus is useful in the analysis when predicting onset of migraine	[6], [2], [4], [3]
Skin temperature	Skin temperature is a measure of the temperature of the skin and can be affected by changes in blood flow and other factors. It has been shown to be a useful biomarker for migraine prediction, as changes in skin temperature are highly correlated with stress and the onset of migraine	[8], [3], [4], [2]

Bibliography

[1] Agata Klimek, Ittay Mannheim, Gerard Schouten, Eveline J M Wouters, and Manon W H Peeters, “Wearables measuring electrodermal activity to assess perceived stress in care: a scoping review,” *Acta Neuropsychiatrica*, vol. 37, no. 19, Mar. 2023, doi: <https://doi.org/10.1017/neu.2023.19>.

[2] Viroslava Kapustynska, Vytautas Abromavičius, Artūras Serackis, Šarūnas Paulikas, Kristina Ryliškienė, and Saulius Andruškevičius, “Machine Learning and Wearable Technology: Monitoring Changes in Biomedical Signal Patterns during Pre-Migraine Nights,” *Healthcare (Basel)*, vol. 12, no. 17, Aug. 2024, doi: <https://doi.org/10.3390/healthcare12171701>.

- [3] Dana P Turner, Adriana D Lebowitz, Ivana Chtay, and Timothy T Houle, "Forecasting Migraine Attacks and the Utility of Identifying Triggers," *Current pain and headache reports*, vol. 22, no. 9, Jul. 2018, doi: 10.1007/s11916-018-0715-3.
- [4] Michael J Marmura, "Triggers, Protectors, and Predictors in Episodic Migraine," *Current pain and headache reports*, vol. 12, no. 81, Oct. 2018, doi: 10.1007/s11916-018-0734-0.
- [5] Anker Stubberud *et al.*, "Forecasting migraine with machine learning based on mobile phone diary and wearable data," *Cephalgia*, vol. 43, no. 5, May 2023, doi: <https://doi.org/10.1177/03331024231169244>.
- [6] Emese Rudics *et al.*, "Quantifying Stress and Relaxation: A New Measure of Heart Rate Variability as a Reliable Biomarker," *Biomedicines*, vol. 13, no. 1, Jan. 2025, doi: <https://doi.org/10.3390/biomedicines13010081>.
- [7] Gonzalo J Martinez *et al.*, "Alignment Between Heart Rate Variability From Fitness Trackers and Perceived Stress: Perspectives From a Large-Scale In Situ Longitudinal Study of Information Workers," *JMIR Humand Factors*, vol. 9, no. 3, Feb. 2022, doi: <https://doi.org/10.2196/33754>.
- [8] Anuja Pinge, Vinaya Gad, Dheryta Jaisighani, Surjya Ghosh, and Sougata Sen, "Detection and monitoring of stress using wearables: a systematic review," *Frontiers in Computes Science*, vol. 6, no. 1, Dec. 2024, doi: <https://doi.org/10.3389/fcomp.2024.1478851>.