# Open Source Health:
# A Universal Device from Brain Stimulation to Cancer Therapy

**Wired Health | Summary of Keynote by Mary Lou Jepsen | Boston | Sept 10 2025**

Yesterday on stage at Wired Health in Boston, I did something I've never done before: I used a radical new medical device live on myself—while speaking. No hospital. No implants. No hole drilled in my skull. Just a lightweight headset, registered to my head using nothing more than a smartphone camera.

With the flick of a switch, I stimulated a cluster of neurons in my anterior cingulate cortex—two inches behind my forehead—while continuing to walk and talk. I could feel the effect: calm, focused, and pain-free.

This wasn't magic. It's physics.

## From Opera Singers to Neurons



The device uses focused ultrasound—but not the expensive, room-sized machines that burn holes in deep tissue to destroy tumors. Ours is small, low-intensity, and radically affordable. It uses sound intensities *lower* than those used on pregnant women and their fetuses for decades.[1]
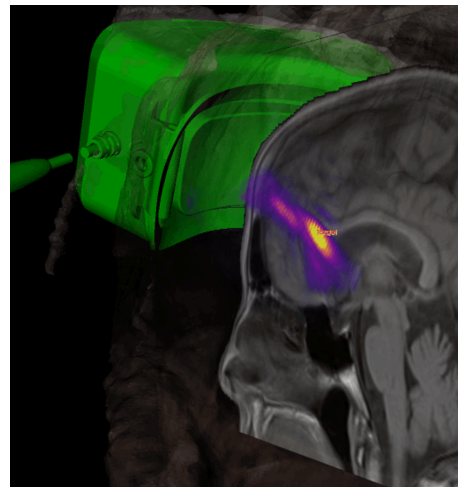
Here's the breakthrough: many types of cells have something akin to a resonant frequency. Just as an opera singer can shatter a wine glass by singing the right note without disturbing anything else in the room, our system can vibrate specific cells at their frequency—neurons, cancer cells, stem cells, even pathogens—while leaving everything else untouched. [2, 3, 4, 5,]

Yesterday, I was pinging neurons. But in clinical trials, we've gone much further.

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[1] https://www.youtube.com/watch?v=cnCw0ElI-Gw
[2] https://pmc.ncbi.nlm.nih.gov/articles/PMC6996285/
[3] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0181717
[4] https://www.sciencedirect.com/science/article/pii/S0041624X21001268
[5] https://www.proquest.com/openview/4d4a1f0bcefae986ba4b84ac561102cc/1.pdf?pq-origsite=gscholar&cbl=18750&diss=y

# From Depression to Cancer to Long Covid

In a clinical trial with patients suffering severe, treatment-resistant depression, two hours of therapy with this device has put a large percentage into lasting remission—without drugs.[6, 7]

By tuning the frequency differently, we've destroyed cancer cells without harming nearby healthy tissue.[8] We've dissolved amyloid microclots—tiny blockages implicated in long Covid, diabetes, neurodegenerative disease, and aging—removing 95% of them in preclinical studies.[9]

In brain organoids seeded with glioblastoma, one of the deadliest cancers, our treatment outperformed chemotherapy. In mice, it shrank tumors dramatically.[10] Human trials are next.

We're even exploring stimulation of stem cells, rejuvenation of aging cells, and deactivation of viruses like COVID directly in the bloodstream. [11]A universal therapeutic device—built not for one disease, but for many.

# A New Model for Medical Innovation

Why does this matter? Because healthcare is broken.

A single new medical device typically runs $650 million in 2024 capitalized costs and takes 13 years to get through regulatory approval.[12] That's one disease, one device, one at a time. It's too slow, too expensive—and meanwhile, patients suffer and patients die.

Our approach flips the standard model. We built a universal semiconductor platform—like a smartphone—where the "apps" can **be** the FDA approvals for different diseases. The upfront cost was higher, but the payoff is a device that's small, reliable, and reconfigurable via software.

After years of building room-sized prototypes, we compressed a phone-booth-sized laser onto a single chip. We collapsed entire carts of analog electronics into miniaturized PCBs. And we designed slim, easy-to-register ultrasound systems using novel semiconductor–ultrasonic transducer arrays with unprecedented software reconfigurability.

The result: a device no longer $1M but with the cost structure of a smartphone, ISO 13485 certification this year, and availability for purchase today.[13]

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[6] https://onlinelibrary.wiley.com/doi/10.1002/jum.16600

[7] https://www.frontiersin.org/journals/psychiatry/articles/10.3389/fpsyt.2025.1451828/full

[8] https://github.com/OpenwaterHealth/opw_oncolysis_data/blob/main/Results_Overview.pdf

[9] https://www.frontiersin.org/journals/bioengineering-and-biotechnology/articles/10.3389/fbioe.2025.1604447/full

[10] https://github.com/OpenwaterHealth/opw_oncolysis_data/blob/main/Results_Overview.pdf

[11] https://pubs.aip.org/aip/apr/article/11/2/021324/3295468/Virus-inactivation-by-matching-the-vibrational

[12] https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2796179

[13] https://www.openwater.health/early-access-systems

Through our partners worldwide—eager to access these systems at a fraction of traditional cost—hundreds of trials are now poised to run in parallel across a dizzying array of diseases, generating safety and efficacy data at unprecedented scale with the promise of rapid and low cost FDA approvals.

We made the system open-source.[14] That means every group using the device can modify it, adopt innovations from others, and rely on us to deliver hardware and services at reasonable cost.

## Data, AI, and the Right to Share

Oh, and we also made a diagnostic device.[15] Our holographic infrared blood-flow system measures blood flow, by some measures ,with twenty times the accuracy of multi-million-dollar MRI machines, in a portable unit. We've already demonstrated LVO stroke detection with excellent sensitivity in hospitals.[16, 17]  We hope it will soon ride in ambulances, cutting treatment delays for stroke victims worldwide.  It's a versatile device that can measure local blood flow and blood volume, as well as perhaps local blood pressure.[18]  This may be useful for monitoring the effect of treatment for many diseases from microclot treatment therapy, to cancer treatments, to neuro-modulation.

As trials scale, so does the data. We envision decentralized clinical trials on the blockchain, where patients can choose whether to share their data, retract it, or even receive micropayments for contributing. If you become the next Henrietta Lacks, you or your family could actually financially benefit on a large scale.

## From Scarcity to Scale

Healthcare today is, unfortunately, structured against innovation. It often takes 20–40 years for a new product to reach patients, and by the time it does, the need to recover those costs makes it prohibitively expensive.[19, 20] Yet the principle of price elasticity is clear: lower the cost and adoption scales exponentially.[21] We've already seen this with DNA sequencers, 3D bioprinters, and electron microscopes. But unlike those tools—confined to labs—our device is designed for widespread, even at-home use. That unlocks a scale of impact far beyond any of those examples, with the potential to reach millions directly in their daily lives.

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[14] https://www.openwater.health/opensource

[15] https://www.openwater.health/product-page/fully-refundable-order-reservation-open-motion-gen3

[16] https://www.frontiersin.org/journals/psychiatry/articles/10.3389/fpsyt.2025.1451828/full

[17] https://www.spiedigitallibrary.org/journals/neurophotonics/volume-11/issue-01/015008/Validation-of-the-Openwater-wearable-optical-system--cerebral-hemodynamic/10.1117/1.NPh.11.1.015008.full#_=_

[18] https://www.spiedigitallibrary.org/journals/neurophotonics/volume-11/issue-01/015008/Validation-of-the-Openwater-wearable-optical-system--cerebral-hemodynamic/10.1117/1.NPh.11.1.015008.full#_=_

[19] https://www.nature.com/articles/nrd3681

[20] https://pmc.ncbi.nlm.nih.gov/articles/PMC1127305/#:~:text=Exorbitant%20medical%20bills%20in%20the,according%20to%20a%20new%20study.

[21] https://en.wikipedia.org/wiki/Price_elasticity_of_demand

A device that once cost nearly a million dollars now has the cost structure of what a smartphone does. Treatments could soon cost no more than a phone call. The implications: faster, broader, more equitable access to care.

## Our Mission

This is the fourth hard-tech startup I've founded. I've spent my career building products that seemed impossible like the $100 laptop from One Laptop per Child— and led hardware at Facebook, Google, Intel and Oculus. I hold more than 300 patents and have shipped hardware that's generated billions in revenue. But Openwater is the most ambitious project of my life.

Our mission is simple to state, hard to achieve:

- A universal device to treat many diseases.

- A path to deliver it quickly and affordably to everyone.

Healthcare is too expensive. It's too slow. And it's too often anti-innovation. By making the tools open, shared, and low cost, we can change that.

**This** is part of the solution.

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# More Info: www.openwater.health