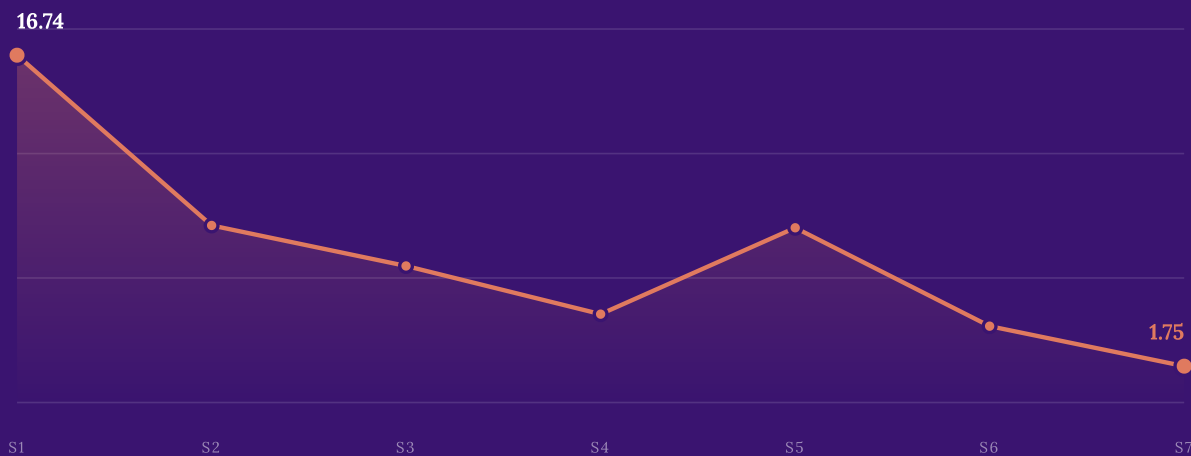


The boy who got angrier

What twenty-nine people in a Salvadoran children's home taught us about measuring recovery — and why the number that went the wrong way was the best news in the study.

MEAN SYMPTOM SCORE · SEVEN SESSIONS · TWENTY-THREE DAYS



29

PARTICIPANTS

26 of 28

IMPROVED

49%

AFTER ONE SESSION

74%

BY FINAL SESSION

Seven sessions of direct neurofeedback over twenty-three days, September–October 2022, at La Casa de mi Padre and the ONUVA school. Delivered by Tiffany Lewis, LMFT. Every figure in this document is generated directly from the practitioner's session records.

He was twelve years old, and he had wet the bed for as long as anyone could remember.

This is not a small thing in a building with three houses and eight children in each. It is laundry, and it is shame, and it is one more piece of evidence for a boy who already has plenty that something is wrong with him. The staff had tried what you try. Nothing had worked.

After his first session of direct neurofeedback — thirty minutes, sensors on the scalp, nothing asked of him, nothing said — it stopped.

That is the story you would expect a nonprofit to lead with, and if this were a fundraising brochure it would be the last thing we told you. But it isn't the interesting part. The interesting part came three weeks later.

Every participant rated five symptoms before each session, from zero to ten: anxiety, insomnia, anger, depression, and physical complaints like migraine. At session four, the boy rated his anger at eight out of ten.

| Eight. Higher than when he started.

On the spreadsheet, that is a treatment moving backwards. It is the kind of data point that gets quietly dropped from a chart, or averaged into invisibility, or explained away in a footnote nobody reads. If you were building a case for funders, you would be tempted to lose him.

Here is what the clinician in the room understood, and the spreadsheet could not. A boy who has been through what he has been through does not walk in carrying a manageable eight out of ten of anger. He walks in carrying nothing at all. Numbness is not calm. It is the nervous system's last resort — the thing it does when feeling anything is more than the system can survive.

His anger score did not go up because he got worse. It went up because he came back.

The instrument has one blind spot, and it matters enormously.

There is a specific problem with measuring recovery in people who have been flattened by trauma, and almost every study that tries to do it runs into some version of it.

What we used is a composite symptom score. Five symptoms, zero to ten each, added together, so the scale runs zero to fifty. It is simple, it is fast, it works with children and with adults who don't share a language with the person holding the clipboard. And it cannot tell the difference between a person who feels fine and a person who cannot feel.

Both of them score low. One of them is well. The other is in the deepest trouble in the room.

This means the measure is systematically conservative in exactly the population it is being used on. The most damaged participants start with artificially low baselines, which makes their improvement look smaller than it is — and if awareness returns before symptoms resolve, as it did for the twelve-year-old, the instrument records them as getting worse.

We are telling you this on page three rather than burying it in an appendix, because everything that follows should be read through it. Twenty-nine people went through this protocol. Twenty-six of the twenty-eight we could score got better. The number is real. It is also, in a way we cannot precisely quantify, *too low*.

THREE · A COUNTRY REBUILDING FROM THE STUDS

El Salvador has spent recent years dismantling the gang structures that ran large parts of it. Whatever else that has meant, it produced a consequence most of the world has not registered: roughly sixty thousand children were left without primary caregivers. A country with almost no child welfare infrastructure is now building one from nothing, at speed, for a population where more than half of young people have already been exposed to significant trauma.

La Casa de mi Padre is a children's home in that country. The courts place children there after abuse, neglect, or abandonment. Three houses, eight or so children in each, ages two to seventeen. Alongside them: house parents, teachers, and support staff at the partner school, ONUVA — adults who spend their days absorbing what the children carry, and who mostly have their own histories underneath.

Tiffany Lewis, a licensed marriage and family therapist, has been running direct neurofeedback in these buildings for years. More than eighteen thousand sessions have been delivered across the deployment. What follows is not that deployment. It is twenty-three days inside it, when someone finally wrote everything down.

Whatever happened in that first thirty minutes, it held.

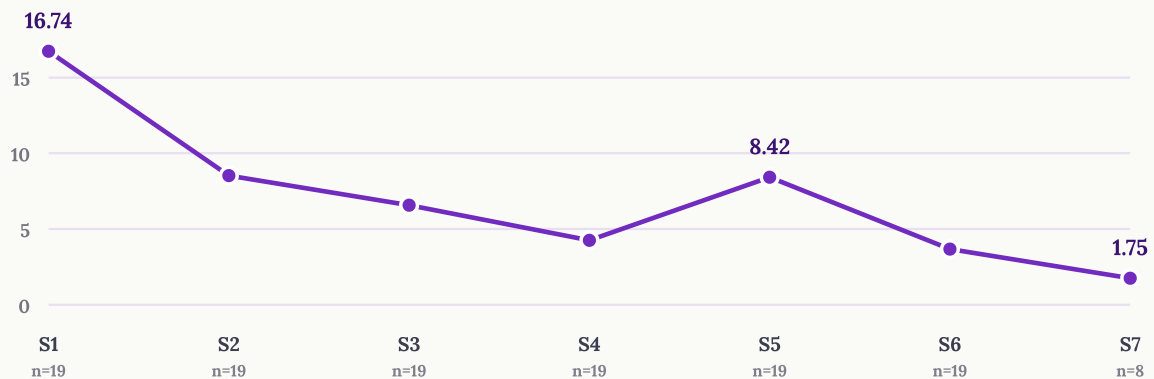
Twenty-nine people enrolled: children, house parents, teachers. Seven sessions each, at most. The whole thing ran from the twenty-ninth of September to the twenty-first of October.

Direct neurofeedback asks nothing of the participant. A very small signal is delivered through sensors on the scalp. It is painless and usually not even noticeable. The brain detects it and self-corrects, releasing patterns it has been stuck in. There is nothing to say and nothing to relive — which is precisely why it reaches people talk therapy cannot: toddlers, non-verbal children, and anyone who has run out of willingness to tell the story one more time.

The average symptom score across all twenty-nine at intake was 14.66 out of fifty. A week later, before the second session, it was 7.66.

Read that again, because the timing is the whole point. Those ratings were taken *before* each session, not after. The 49% drop is not how someone felt walking out of the room. It is what was still true a week later, when they walked back in.

Mean composite symptom score — the same nineteen people at every session



Five symptoms, 0–10 each, summed. Ratings taken before each session. Session seven shows the eight participants who reached it.

By the end, the average participant's symptoms had fallen 74% from baseline. The median was 87%. Twelve of the twenty-nine reached zero.

But the line does not fall smoothly, and we want to show you exactly where it doesn't. At session five the average goes up. It happens again in a fixed group of nineteen who attended every session, so it isn't an artifact of who showed up.

Here is what it is. Sessions were scheduled around a working school, not a research design. Sessions two, four and seven were rated the day after the previous session. Sessions three, five and six about a week after. Across the study, scores rose at 44% of the week-gap measurements and only 14% of the next-day ones. The protocol wasn't failing at session five. The benefit was wearing off between visits — and one participant said so, in the notes, at session six: *"had increased anxiety at night after NF wore off."*

She had stopped having seizures, and said nothing for three weeks.

One of the teachers in the study had been having grand mal seizures. Two or three a week. After her first session, they stopped completely.

She did not tell the practitioner for three weeks. When she eventually did, she had been attributing the change to something else entirely — she thought she had simply become more patient in the classroom. Epilepsy carries a stigma in her community that is hard to overstate, and the easiest thing to do with a symptom like that is not to name it.

We include this not because it is a miracle story. A single case proves nothing, and we make no claim that direct neurofeedback treats epilepsy. We include it because of what her silence implies about everything else in this document.

Every instinct in that room pushes reported symptoms down at intake — which pushes measured improvement down with it.

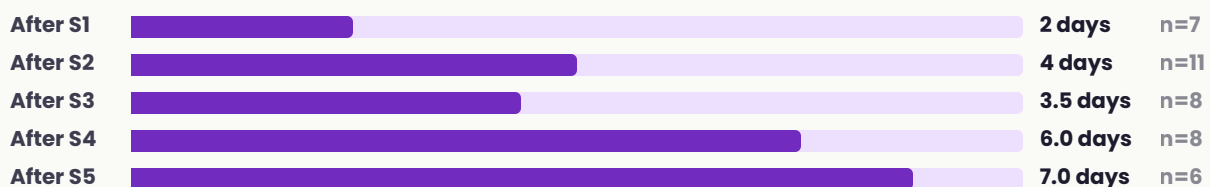
The numbers here are what people volunteered, in a small community, about symptoms that carry shame. Insomnia is easy to admit. Anger is harder. Seizures went unmentioned for three weeks by someone who had already experienced the outcome. The number is 74%. We would not be surprised if the truth were higher. We have no way to prove that, so 74% is what we publish.

SIX · DOES IT LAST?

This is the question every funder asks, usually within the first ten minutes. A treatment that works for a week is a treatment that has to be delivered forever.

The tracking form had a column nobody had ever analysed: how long each session's effect held.

Median days the effect held, by session



Each session held longer than the one before it. That is also why the sawtooth flattens by session six — the benefit period grew until it spanned the gap between visits.

Participants who complete the protocol move onto a maintenance schedule. That is the honest answer, and a better one than the alternatives. This is not a cure that ends the story, and it is not an appointment every week for life. It is an intensive period that stretches the interval until a maintenance cadence can hold it.

One caution. You cannot observe an effect lasting longer than the gap before the next measurement, and those gaps grew as the study went on. The trend is real in direction; it is not a clean dose-response curve. Establishing true durability needs a follow-up study with fixed intervals. We have not run one; we would like to fund one.

A study where everybody wins is a study nobody should believe.

- There was no control group. Everyone received the protocol, so we cannot separate its effect from time, attention, or the fact that a room full of adults had become visibly hopeful.
- The symptoms were self-reported — some of them by children, in a setting where the people asking were the people they live with.
- It was small and short. Twenty-nine people, twenty-three days, and only eight reached a seventh session.
- The sessions were unevenly spaced, which is why the curve behaves the way it does.
- One participant finished worse than he started. Participant 28 went from seventeen to four to zero — and then, at session four, to twenty. We do not know why. It could be a life event. It could be the same thing that happened to the twelve-year-old. We are not going to guess in a document like this, and we are not going to remove him from the chart.

EIGHT · THE GAP IS NOT PROOF

Direct neurofeedback is not new and it is not fringe. It has been used in research settings, professional sports facilities and a handful of clinics for two decades. It is FDA-cleared. There are hundreds of papers. It is not in your therapist's office for a reason that has nothing to do with evidence: it is not in the curriculum. Talk modalities are. This isn't.

What happened at La Casa de mi Padre was not a breakthrough in neuroscience. It was a piece of equipment, a trained practitioner, and twenty-three days in a building that already had everything else it needed — the staff, the children, the trust, the years of work. The technology did not do the hard part. It made the hard part possible.

The government of El Salvador is now examining direct neurofeedback for its developing foster care and prison systems. There are sixty thousand children in that country who need someone to have figured this out already.

Restore the Last funds the technology, the training and the ongoing support into organisations already doing the work. They bring the people. We bring the thing they cannot afford.

The evidence is not thin.

The gap is not proof.

The gap is resources.

TALK TO US

If your organisation serves people that credentialed therapy is not reaching — or you fund those who do — we would like to hear from you. restorethelast.org/partners

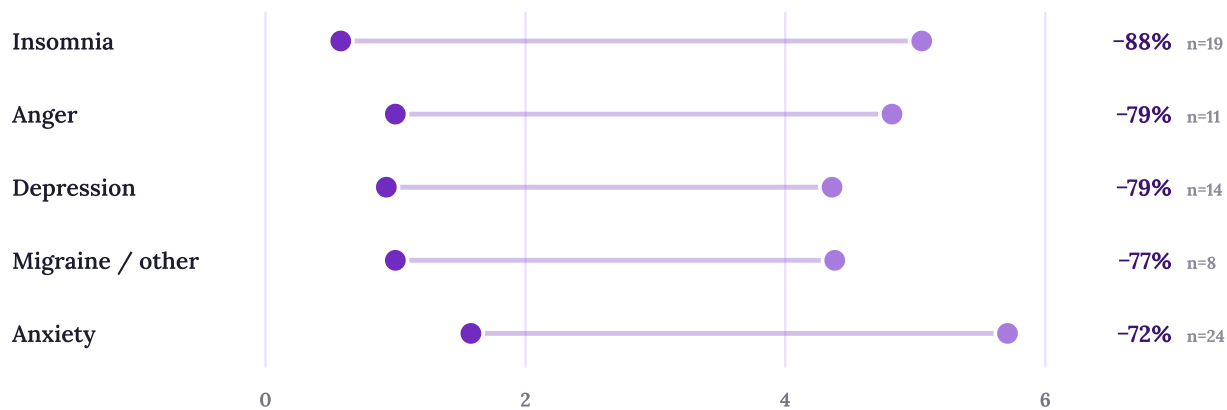
The data

Generated from the practitioner's session records. Composite score = five symptoms, 0–10 each, summed (0–50), rated before each session.

SESSION	N	MEAN, ALL ATTENDEES	MEAN, FIXED COHORT OF 19
Session 1	29	14.66	16.74
Session 2	29	7.66	8.53
Session 3	28	6.61	6.58
Session 4	26	5.62	4.26
Session 5	25	7.2	8.42
Session 6	20	3.5	3.68
Session 7	8	1.75	1.75

Symptom ratings, first session to final session

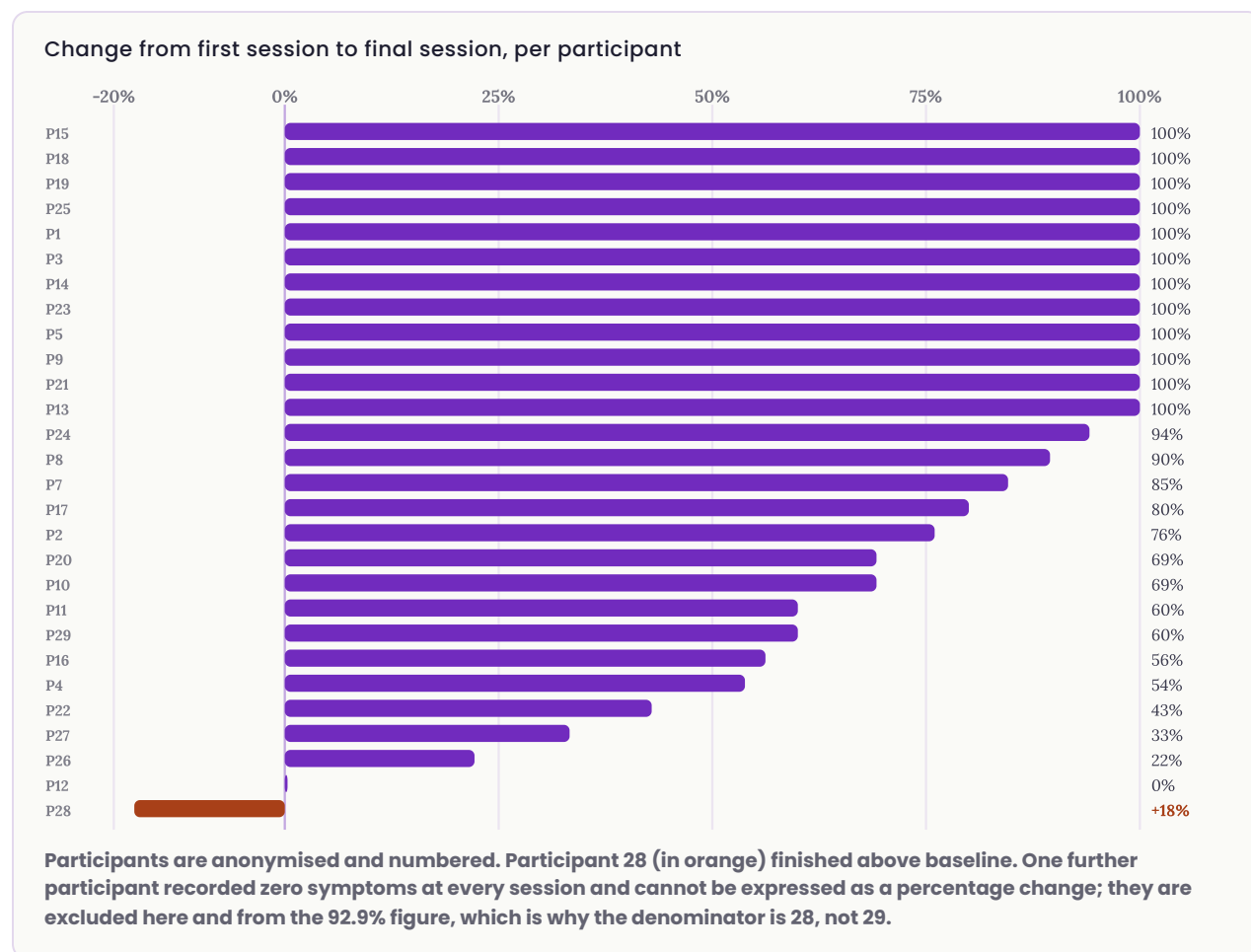
● First session ● Final session



SYMPTOM	N	FIRST	FINAL	CHANGE
Insomnia	19	5.05	0.58	-88.5%
Anger	11	4.82	1.0	-79.2%
Depression	14	4.36	0.93	-78.7%
Migraine / other	8	4.38	1.0	-77.1%
Anxiety	24	5.71	1.58	-72.3%

Symptom-level ratings exist for 25 of the 29 participants, so these rest on a smaller sample than the headline figures. Only participants reporting a given symptom at intake are counted in that row.

Every participant, and how we counted



METHOD

Twenty-nine participants — children, house parents and teachers at La Casa de mi Padre and ONUVA — received up to seven sessions of direct neurofeedback between 29 September and 21 October 2022, delivered by Tiffany Lewis, LMFT.

Before each session participants rated anxiety, insomnia, anger, depression and migraine/other from 0 to 10. Attendance was recorded per session; absent sessions are excluded rather than scored as zero. Improvement is each participant's final attended session against their first.

Every figure regenerates from the source workbook by script. No figure in this document is typed by hand.

SIDE EFFECTS

Roughly fifteen reports across 149 recorded sessions, about one in ten: tingling in the hands, mild headache of ten to twenty minutes, next-day headache, tiredness, or pressure at the electrode sites. All resolved on their own.

One was more than mild — a participant had a migraine and vomited after her sixth session. It did not recur, and her symptoms fell from 34 to 2 over the protocol.

LIMITATIONS

No control group; self-reported symptoms; small sample; short window; unevenly spaced sessions; and a composite score that under-reads improvement in participants whose baseline was suppressed by emotional numbing.