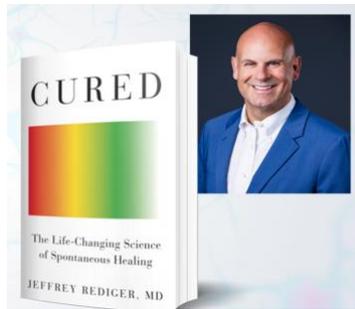


Cured
Excerpt from Chapter 6
The Healing Heart: Love Medicine
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(2661 words)



LOVE MEDICINE

When we experience feelings of love and connection, our brains release a cocktail of hormones and chemicals. How exactly that cocktail is mixed (i.e., *which* hormones specifically are dumped into your bloodstream) depends on what type of experience you're having. Attraction, romantic love, platonic love, and social connection all have their own specific mixture, but most involve some combination of dopamine, testosterone, estrogen, vasopressin and most importantly, *oxytocin*. Oxytocin, first isolated in new mothers nursing their babies, is often called “the love drug” because it's both activated by, and helps to *create* connection, attraction, love and bonding. And beyond helping to make and deepen relationships, it has health benefits. Oxytocin is known to be a kind of anti-stress tonic, counteracting the effects of fight or flight and stress hormones. It is also both anti-inflammatory and parasympathetic in its effects.

So what controls the release of this “love medicine” into your body? The vagus nerve. *Vagus* is Latin for *wandering*, and in line with its poetic name, the vagus wanders everywhere through your body. It exits the brain stem at the base of your skull, deep in your neck. It actually runs quite close to the carotid artery. Press your fingers to the pulse point on your

neck and you are as close as you can get to your vagus nerve. From that spot under your fingers, it shoots down to your heart and beyond, where it regulates heartbeat and dozens of other vital functions. If you have any doubts about how deep and rapid the connection is between mind and body, the vagus is that literal link between the two – a thick, humming power line that runs from your brain to your gut.

The vagus nerve, in the way that it passes information both upstream and down, works a lot like the nutrition system in a tree. Picture your body as a tree, and the vagus nerve as the xylem and phloem, the transport tissues deep inside a tree's structure that pull water up to the leaves and then pass nutrients back down through the trunk. Your vagus nerve functions the same way, but with information. Remember those old pneumatic tube systems that banks used to have—you'd put your deposit envelope in the little canister, and it would woosh away? Imagine that happening in the vagus nerve, up and down, passing messages between mind and body millions of times over the course of a day.

Eighty percent of the vagus pulls information up into the brain. The other 20 percent sends information down into the body. This means a great deal of sensory information is being collected for your brain and that decisions are then made in the brain and then sent out all over the body. It's a rapid, constantly flowing system that allows your heartbeat, breathing, digestion, endocrine system (the network of glands that releases hormones through your body), and immune system to constantly adjust and respond to all the collected information.

Think of how often you've used the phrases *gut feeling* or *broken hearted* or told someone you had *butterflies in your stomach*. You feel different emotions in different parts of your body for a good reason: these areas are hotbeds of neuroreceptors. Recent research is showing that we actually have three "brains"—the head brain, heart brain and gut brain—and our health and development depend on keeping them in balance and alignment. With the vagus as the connecting cord, emotions flood through our systems in the form of neural messages and hormones. Some signals begin in the gut, or the heart, and flow upstream to the head brain, while others cascade from above. In this way, our thoughts and emotions have

both instant and long lasting effects on all our biological systems: nervous, endocrine, immune.

In the previous chapter, we talked about the relaxation response and why it works. What we didn't talk about was the role of the vagus in that physiological response. When you do the deep, abdominal breathing that Benson recommends, you stimulate your vagus nerve. Even a deep sigh can activate it briefly – think of brushing your fingers over guitar strings, eliciting a rich, vibrating chord that reverberates for a couple of seconds. When you experience feelings of love and connection, it's like playing a whole song for your vagus nerve. The level of cortisol in your system begins to drop, and your telomerase is allowed to build back up to a healthy, balanced level. If you can keep on strumming those strings and keep your parasympathetic activated, a host of amazing health benefits will follow.

We know that inflammation is the common pathway underlying many diverse illnesses. But renowned neurosurgeon, immunologist, and inventor Kevin Tracey made an important discovery after the death by sepsis of a young woman under his care: the vagus nerve appears to be an “inflammatory reflex” that works in the opposite direction of chronic inflammation, to offset or reverse its deleterious effects¹ When activated, the vagus senses inflammation in the body and relays this information to the brain and central nervous system, which then reflexively powers up the immune system, inhibiting inflammation and preventing organ damage. Studies are under way to explore the extent to which stimulation of the vagus can prevent or reverse many inflammatory diseases, including arthritis, colitis, epilepsy, congestive heart failure, sepsis, Crohn's disease, headaches, tinnitus, depression, diabetes, and possibly other autoimmune diseases. But the question then becomes: How do you activate or stimulate your vagus nerve?

The vagus is a nerve, but in one important way, it's more like a muscle—the more you use it, the stronger it becomes. Using the vagus—stimulating it through everything from deep breathing to connecting with a friend or partner—is like flexing your biceps as you lift weights, it increases its strength, flexibility, and elasticity. And just like with physical exercise, the

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more you use it, the better you get at using it, and the more health benefits you reap.

Remember when I said that you don't have to go falling in love with every person you meet to reap the health benefits of micro-connection? Well, an expert in the burgeoning field of "positive psychology" and its biological impact on the body disagrees – sort of.

Barbara Fredrickson, a lead researcher at the University of North Carolina—Chapel Hill, has immersed herself in research on this topic for over two decades. She's run study after study² showing that what truly tones the vagus nerve is small moments of connection—a sort of "falling in love" if you will—with the people who surround you on a day-to-day basis, everyone from your husband or wife, to children, to the barista you're getting to know at your coffee shop. It could even be a total stranger you meet on the street.

Fredrickson's research was fresh in my mind one morning as I was walking to a meeting along the streets of Cambridge. I zoomed by person after person who didn't meet my gaze as we passed on the redbrick sidewalk. They were lost in thought or wrapped up in the music I could hear coming from their headphones, faint and tinny. But as I crossed over the Charles River on a busy bridge, I fell in step next to an older woman pushing a baby in a stroller. I smiled at the baby, who turned out to be her grandson, and she smiled at me; when she broke the ice by asking where a particular building was on campus (the baby's mother, a student, was waiting there to breastfeed him), we fell into an animated discussion of children, families, and life with babies. I found myself remembering the years when my kids were infants and the difficulties and joys of that time. We ended up laughing together over the baby's unselfconscious facial expressions.

Fredrickson believes that culturally, we underestimate these fleeting moments of connection. They're more important than we realize. While I was talking with this grandmother, whose name I never even caught, I was wrapped up in our conversation, laughing, making eye contact, and when we arrived at the building, it seemed like the long cold walk had flown by. I

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held the door for her as she struggled inside with the stroller, she waved goodbye and disappeared down a hallway. I realized that in that fleeting conversation, I'd experienced a real moment of connection with someone, and "exercised" my vagus nerve in the same way I work out my leg and heart muscles when I go for a run.

And just as exercise tones muscles, stimulating the vagus in the same way. *Vagal tone* refers to your ability to rapidly activate the parasympathetic. The higher the vagal tone you have, the more rapidly you can recover from stress and relax into healing mode. Whereas doing reps with a hand weight will tone your biceps, positive emotions like love actually tone your vagus.

What is love? In very important ways, it may not be what we think it is. It's not a continuous, never-ending state that we exist in when we're "in love" with a romantic partner. Or at least, it's not that *exclusively*. According to Fredrickson, love is a series of "micro moments of positive resonance"³ that we experience, over and over again, as we go through life. We may have just one of these micro-moments with a stranger at a bus stop; or a million of them over the course of a lifetime with the person we marry. We think of the love we share with a spouse as being the most "important" love out there, and in certain aspects – socially, culturally—it is. What we don't realize is that when it comes to our health and biological systems, each moment of micro-connection – whether it's with your spouse, with a friend, or with an Uber driver you just met – is equally as important as the next and carries the same weight.

Think of each of these moments of connection over the course of your typical day as stars, appearing in the sky as the sun goes down. Each one is its own individual, bright moment, and as the stars emerge, they begin to fill the sky with points of light. There might be a hundred stars that represent micro-moments with your partner or child, forming constellations that represent those important relationships, and one solitary star representing the laugh you shared with a coworker on a thirty-

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second elevator ride. But each one did essential work, quietly, inside your body – it lit up your vagus nerve.

Our narrow concept of love could be making us sick. In her book on the topic, *Love 2.0: Finding Happiness and Health in Moments of Connection*, Fredrickson makes the bold claim that our fixation on the idea of love as something that can only be shared in long-term, intimate romantic relationships shows “a worldwide collapse of imagination.” She writes: “Thinking of love purely as romance or==== commitment that you share with one special person – as it appears most on earth do – surely limits the health and happiness you derive from micro-moments of positivity resonance. Put differently, your beliefs about what love is become self-fulfilling prophecies.”

Essentially, Fredrickson is telling us that to feel better, we need to expand our definition of love. We need to see all moments of micro-connection as meaningful – because when we do, we are more open to connection and more open to feeling the positive emotions of love, compassion, and empathy. In this way, our vagus nerve gets stimulated again and again and again, and the positive effects begin to build on one another, growing stronger. This leads to what Fredrickson calls an “upward spiral of the heart.” It turns out that vagal tone, and the ability to experience moments of love, compassion, and connection; *increase* in relationship to each other, exponentially. That means that the higher your vagal tone, the abler you are to easily engage and connect with people, and the more you engage and connect with people, the higher your vagal tone.

That might sound like a catch-22 where, if you’re not very good at forging social connections, you’re screwed. Luckily, that’s not the case! It is a self-perpetuating cycle, where the better you get at it, the more health benefits you reap, and the easier it gets. Fredrickson calls it a “use it or lose it” situation. If you’re rusty, you have to get back on the bike and teach yourself to ride again. It’ll feel awkward and hard at first, but it doesn’t take very long until it becomes second nature and you gain momentum.

To test the idea of the reciprocal loop, Fredrickson ran a study⁴ where participants signed up to practice a certain type of meditation called *loving-kindness meditation*, or LKM. People were randomly selected from a pool of volunteers to take a six-week course in LKM, which focuses on training participants to cultivate feelings of love, compassion, and goodwill toward themselves and others. The study wasn't especially demanding in terms of immersion; participants were simply asked to practice the meditation tactics they'd learned at home, whenever they wanted, for however long they wanted. It was up to them. They gave the researchers daily reports on both their meditative activity and their social interactions on that day.

Fredrickson and her research partner, Bethany Kox of the Max Planck Institute for Cognitive and Brain Sciences, tested their subjects' vagal tone (we'll get into how that's measured a bit later) before the study and then after. They found that as study participants' positive emotions increased through LKM, so did their social interactions, and as the number of social interactions went up so did vagal tone. And the higher your vagal tone was when you started, the more it increased over the course of the study. There it was: the upward spiral.

The good news is that there's no certain level that you need to achieve on this spiral. It's not like Chutes and Ladders, where you have to land *exactly* on the right square to climb the ladder toward healing and health. Fredrickson emphasizes that there are "multiple points of entry" to the spiral. And the higher you get, the faster you progress. Love is a spiral that lifts you higher and faster the more you allow yourself to feel it.

To return to the idea of the guitar, the more you practice, the better at it you'll get, and the more beautiful the music you make. Strumming the strings of your vagus nerve works the same way. Make sure you're playing your music, and keeping that instrument warmed up and in use. But just as with Benson's relaxation response, a little bit goes a long way. And this begs the question: What could be achieved, health- and healing-wise, if you devoted yourself to even more deeply to these practices?

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We talked in the previous chapter about how our bodies are, from an evolutionary perspective, preprogrammed to drop into fight or flight at the slightest provocation. Indeed, it's the reason we're here – those of us who are alive today exist because our ancestors had a very highly developed, sharply honed fight-or-flight response that allowed them to live long enough to reproduce. We discussed the idea of learning how to override this programming now that we live in the modern world, where our fight-or-flight response is turned on too much of the time. But the deeper, more complicated truth is that we also have ancient programming that runs concurrent to that—programming that actually wants us to be in the parasympathetic. In fact, we are descended from the early humans who not only were adept at dropping *into* the sympathetic but adept at shifting back *out* of it, too.

Footnotes

1. “The Inflammatory Reflex: A New Understanding of Immunology.” SetPoint Medical, <https://setpointmedical.com/cp/science/inflammatory-reflex/>.
2. *Open Hearts Build Lives: Positive Emotions, Induced Through Loving Kindness Meditation*, Journal of Personality and Social Psychology 95, no. 5 (2009) 1045-1062
3. Barbara Frederickson, *Love 2.0: Finding Happiness and Health in Moments of Connection* (New York: Hudson Street Press, 2013)
4. Bethany Kok and Barbara Frederickson, “Upward Spirals Of The Heart: Autonomic Flexibility As Indexed By Vagal Tone, Reciprocally and Prospectively Predicts

Positive Emotions and Social Connectedness, *Biological Psychology* 85, no.3
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