Rhythms Out of Tune

The frequencies of bodily and mental imbalance, the frequencies that treat them, and a device programme on the Vacuum.Net ladder

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Abstract

Twenty-four measured rhythms of the healthy and the disturbed body and mind, from 30 Hz brain activity to yearly mood cycles, were placed on the ring ladder of the Vacuum.Net Theory; healthy rhythms do not sit measurably closer to rings than chance (mean distance 0.216 against 0.25 expected, p = 0.24). The ladder has one free unit, fixed by hydrogen, and a step of three; it turns any frequency into a depth.

The rhythms come from neurology (epilepsy, tremor, Parkinson's disease, Alzheimer's disease, schizophrenia, ADHD), cardiology (heart rate, atrial fibrillation, heart-rate variability), respiration and circulation (breathing rate, Mayer waves, Cheyne–Stokes breathing), the gut (gastric slow wave) and slow clocks and mood (90-minute cycle, day, rapid-cycling bipolar disorder, seasonal depression). Each value was taken from opened sources, most from two.

One exploratory pattern stands out: in six of seven pairs where a healthy rhythm and its disturbed form are both measured, the disturbed form lies farther from the nearest ring (sign test p = 0.06). Breathing is the exception. The pattern was found after the fact and is offered as a prediction to be tested, with refutation conditions, not as a finding.

The article then turns to treatment. Seven proven treatment frequencies (deep brain stimulation, rTMS, theta burst, vagus nerve stimulation, pulsed fields for bone, 40 Hz gamma) do not sit on rings either (mean distance 0.285, p = 0.74), and within one device the effective frequency is not the one closer to a ring. Russian devices (SCENAR, ALMAG) use frequencies very close to ring 29, but the one sham-controlled trial found (SCENAR, n = 60) was negative. The theory explains this by its first rule, read the state first, which no tested device did. Section 11 turns that into a device programme: ring-shift trials on approved devices, eight design rules, and four candidate offerings, each with a refutation condition.

A separate section treats the microbiome. Gut bacteria swing over the day with the host's meals; jet lag disturbs them, and their disturbance alone transfers weight gain to germ-free mice; one bacterial strain changed stress behaviour in mice only while the vagus nerve was intact. In *E. coli*, one millimetre-wave line had opposite effects on growing and resting cells, the theory's rule of state first seen in bacteria.

Nothing in this article is medical advice.

1. The ladder: how a frequency gets a depth

Every frequency in this article is given a depth on one ladder whose step is a factor of three. In the Vacuum.Net Theory a ring of three equal passages closes and becomes one passage of the scale above; one ring up is therefore three times slower. The theory itself is dimensionless. One length and one time fixed by hydrogen alone turn its ring number into seconds, so nothing about the human body is used to set the scale.

$$R_H = \frac{R_\infty}{1 + m_e/m_p}, \qquad S_0 = \frac{1}{2R_H} = 4.5588 \times 10^{-8}\ \text{m}, \qquad T_0 = \frac{S_0}{c} = 1.52066 \times 10^{-16}\ \text{s}$$

Ring n has period $3^n \cdot T_0$. Any measured frequency f therefore has a depth

$$n(f) = \log_3\!\left(\frac{1}{f\,T_0}\right)$$

A whole number n means the rhythm sits exactly on a ring; a fractional part of 0.5 means it sits as far from any ring as possible. Inputs are CODATA 2018 values (R_∞ = 10,973,731.568160 m^{-1}, m_p/m_e = 1,836.15267343, c = 299,792,458 m/s). All values below were recomputed for this article.

Ring	Frequency	Period	Per minute
29	95.82 Hz	10.44 ms	—
30	31.94 Hz	31.31 ms	—
31	10.647 Hz	93.93 ms	—
32	3.549 Hz	0.2818 s	213
33	1.1830 Hz	0.8453 s	71.0
34	0.3943 Hz	2.536 s	23.7
35	0.1314 Hz	7.608 s	7.89
36	0.04381 Hz	22.82 s	2.63
37	14.60 mHz	68.47 s	0.876
41	0.180 mHz	92.44 min	—
43.5	—	1 day	—
48.9	—	1 year	—

2. Method

A rhythm was included only if it is a measured frequency or period that clinical or physiological literature ties to a named state of balance or imbalance. Frequencies proposed only as treatments (Rife, Russian therapy tables, Global Scaling node lists) were excluded, because no blinded study confirms their disease-specific pairing.

1. **Sources.** Every number was taken from a page that was opened, not from a search snippet or memory. Where possible a second, independent page was opened for the same number; the ledger in section 14 marks the few rhythms that rest on one source.
2. **Ranges.** Where sources differ, the wider range is used and both are cited (gastric slow wave: 2.4–3.6 cpm and 2.5–3.75 cpm). A rhythm reported as a single value is used as that value.
3. **Depth.** Each range [f_lo, f_hi] was turned into a depth interval with $n(f) = \log_3(1/(f \cdot T_0))$. The centre of a range is its geometric mean, the natural middle on a ladder of factors.
4. **Distance to a ring.** For each centre, the distance to the nearest whole ring was computed. It lies between 0 (on a ring) and 0.5 (exactly between two rings). If rings meant nothing, distances would be spread evenly over that interval, with a mean of 0.25.

5. **Labels.** Each rhythm was labelled healthy or imbalance before any distance was computed. Seasonal depression was left unlabelled, because a yearly mood cycle in a healthy person is not established.

3. Brain and nerves

The disturbed brain rhythms all lie between rings 30 and 32 (3.5 to 32 Hz). The slowed forms of the two healthy ring-31 rhythms (Alzheimer alpha, essential tremor) move away from ring 31; Parkinson tremor and absence seizures sit near ring 32.

Rhythm	State	Measured	Depth	Nearest ring, distance	Sources
Physiological tremor	healthy	8–12 Hz (6–8 Hz in some elderly)	30.89–31.26	31, 0.08	Elble 2005; FMOLHS
Alpha peak frequency, healthy older adults	healthy	8.8–8.9 Hz; slows with age	31.16–31.17	31, 0.17	Front. Hum. Neurosci. 2026; Scally 2018
Alpha peak frequency, Alzheimer's disease	imbalance	7.4–8.1 Hz	31.25–31.33	31, 0.29	Front. Hum. Neurosci. 2026 (Schumacher 2020; Babiloni 2022)
Essential tremor	imbalance	4–8 Hz, falls over years; 4–10 Hz	31.06–31.89	31, 0.47	Elble 2005; FMOLHS
Parkinson rest tremor	imbalance	4–6 Hz; 3–5 Hz	31.52–32.15	32, 0.16	Front. Integr. Neurosci. 2012; FMOLHS
Absence seizure, spike-and-wave	imbalance	2.5–4 Hz, typically 3 Hz; 10–30 s	31.89–32.32	32, 0.10	ILAE; Wikipedia
Parkinson beta synchrony	imbalance	13–35 Hz, strongest near 20 Hz	29.92–30.82	30, 0.37	Front. Integr. Neurosci. 2012; Swan 2019
40 Hz auditory steady-state response, reduced in schizophrenia	imbalance	40 Hz; power d ≈ 0.5–0.7	29.80	30, 0.20	Zouaoui 2023
Theta band, raised theta/beta ratio in an ADHD subgroup	imbalance	4–8 Hz	31.26–31.89	32, 0.42	Arns 2013

Three notes change how these rows should be read.

- **Parkinson beta is a marker, perhaps not a cause.** Levodopa and deep brain stimulation suppress it as stiffness and slowness improve, but not tremor. In rats, beta-patterned stimulation alone did not produce slowness (Swan 2019).
- **The ADHD ratio is not diagnostic.** A meta-analysis found effect sizes of 0.62–0.75 that shrank over the years, and concluded that excessive theta/beta "cannot be considered a reliable diagnostic measure" (Arns 2013).
- **40 Hz is also a treatment candidate.** In a small randomised, placebo-controlled pilot in mild Alzheimer's disease (n = 15), daily 40 Hz light and sound slowed ventricular enlargement at three months and improved one memory test, but not global cognition (Chan 2022).

4. Heart, vessels and breathing

The normal resting heart rate lies on ring 33 (71 beats per minute), and tachycardia lies almost exactly between rings 32 and 33. Breathing runs the other way: the normal rate sits between rings, and fast breathing lands on ring 34.

Rhythm	State	Measured	Depth	Nearest ring, distance	Sources
Resting heart rate	healthy	60–100 per min	32.69–33.15	33, 0.08	ECG book; FIU
Tachycardia (fast ventricular response)	imbalance	100–160 per min	32.26–32.69	32, 0.47	ECG book; FIU
Atrial fibrillation, atrial activity	imbalance	350–700 per min (5.8–11.7 Hz)	30.92–31.55	31, 0.23	ECG book; FIU
Breathing rate	healthy	12–20 per min	34.15–34.62	34, 0.39	Wikipedia: Tachypnea; HRV bands
Tachypnea	imbalance	over 20 per min	33.78–34.15	34, 0.03	Wikipedia: Tachypnea
Resonance breathing (heart-rate variability peak)	healthy	4.5–7 per min, most often 5.5	35.11–35.51	35, 0.31	Front. Public Health 2017
Mayer waves of blood pressure	healthy	about 0.1 Hz; a shift to lower frequency goes with a higher risk of hypertension	35.25	35, 0.25	Wikipedia: Mayer waves (Takalo 1999)

Rhythm	State	Measured	Depth	Nearest ring, distance	Sources
Cheyne–Stokes breathing cycle, heart failure	imbalance	about 60–85 s; longer in worse failure	36.88–37.20	37, 0.04	Saito 2022; Swiss Med Wkly

Two measures here are risk signals rather than single frequencies.

- **Heart rate.** In a meta-analysis of 46 studies and 1.2 million people, each 10 beats per minute higher resting rate raised all-cause mortality by 9 % (relative risk 1.09, 95 % CI 1.07–1.12) (Zhang 2016).
- **Heart-rate variability.** After a heart attack, an SDNN below 50 ms predicted higher mortality in 808 patients followed for 34 months (Kleiger 1987, in Huikuri 2012; WJC 2017). Its spectral bands are LF 0.04–0.15 Hz (rings 35–36) and HF 0.15–0.40 Hz (ring 34).

5. Gut, slow clocks and mood

The normal gastric rhythm and the 90-minute rest–activity cycle sit close to rings 36 and 41; the solar day sits exactly between rings 43 and 44, the farthest from any ring of all 24 rhythms.

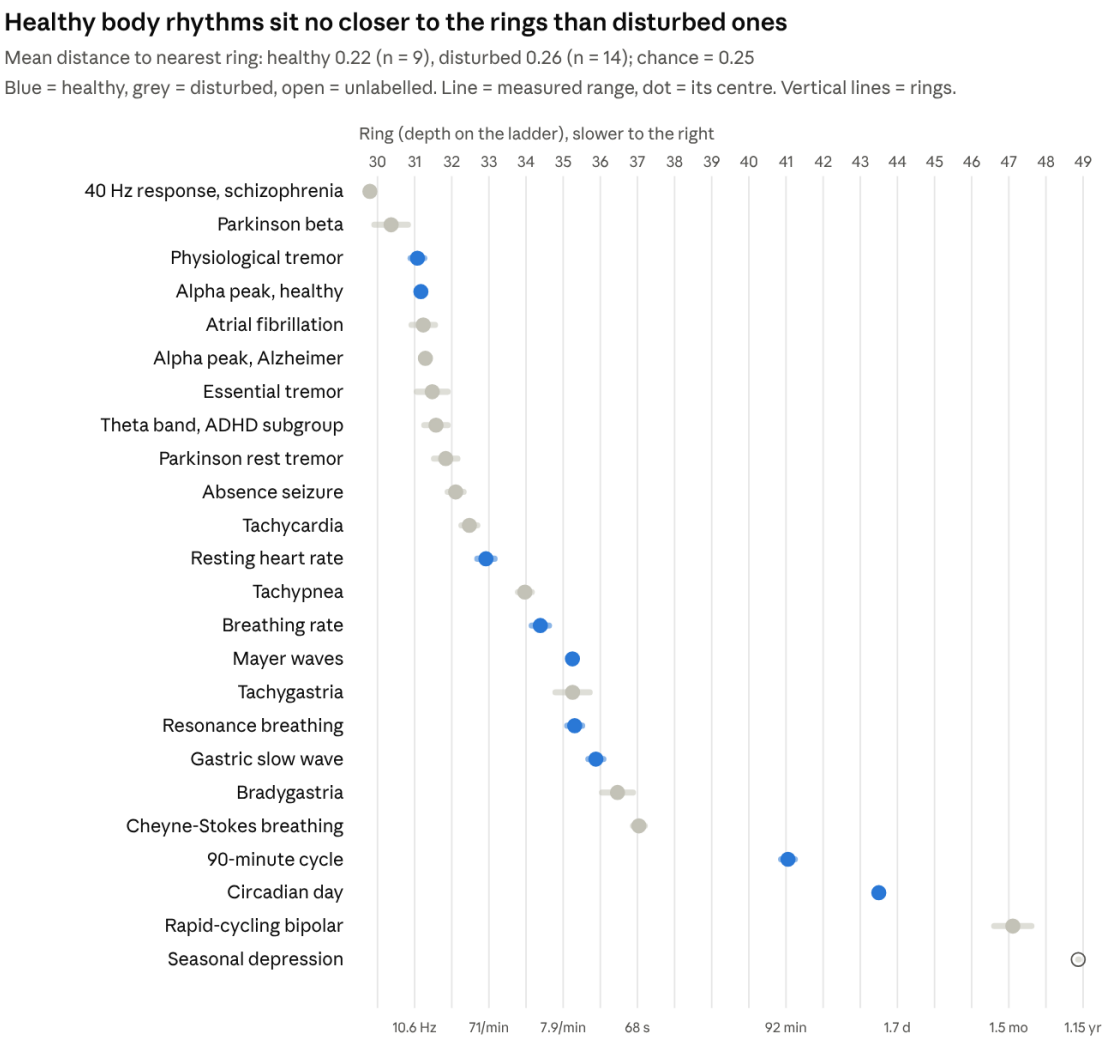
Rhythm	State	Measured	Depth	Nearest ring, distance	Sources
Gastric slow wave	healthy	2.4–3.6 cpm; 2.5–3.75 cpm (about 3 cpm)	35.68–36.08	36, 0.12	WJG 1996; Wikipedia: Electrogastrogram
Bradygastria	imbalance	1–2.4 cpm; below 2.5 cpm	36.05–36.88	36, 0.46	same
Tachygastria (nausea, gastroparesis, dyspepsia)	imbalance	3.6–9.9 cpm; above 3.75 cpm	34.79–35.71	35, 0.25	same
Basic rest–activity cycle	healthy	about 90 min (80–120)	40.87–41.24	41, 0.05	Wikipedia: BRAC
Circadian day	healthy	24 h	43.50	43 or 44, 0.50	—
Rapid-cycling bipolar disorder	imbalance	4 or more mood episodes a year (period 1–3 months)	46.61–47.61	47, 0.11	Am J Psychiatry 2005; Bipolar Disord. 2008

Rhythm	State	Measured	Depth	Nearest ring, distance	Sources
Seasonal affective disorder	unlabelled	one cycle a year, onset autumn or winter, remission spring	48.87	49, 0.13	PsychDB

The circadian imbalance has no frequency of its own: it is a shift of phase against the day, not a change of period. Night shift work involving circadian disruption is classified by IARC as probably carcinogenic to humans (Group 2A, updated 2019), with limited human evidence for breast, prostate and colorectal cancer (ESMO). Rapid cycling was found in 38 % of 539 outpatients with bipolar disorder in one specialist sample and in 12–24 % of specialist-clinic patients in a review.

6. The map

All 24 rhythms span twenty rings, from 40 Hz brain activity at depth 29.8 to the yearly cycle at depth 48.9, and healthy and disturbed rhythms are mixed along the whole ladder.



Depths computed from the sources in sections 3–5 · 24 rhythms · ranges are the widest cited

Most measured ranges are wide on this scale: a range that covers a factor of two contains a ring 63 % of the time by chance, and a factor of three always does. Whether a range contains a ring is therefore no evidence; the test in the next section uses the distance of each centre instead.

7. The test

The ladder does not pass the first test: healthy rhythms sit at a mean distance of 0.216 from the nearest ring, and a random set of nine values would sit that close or closer 24 % of the time.

Comparison	Observed	Expected by chance	Result
Healthy rhythms, mean distance to nearest ring (n = 9)	0.216	0.25	p = 0.24 (one-sided, 200,000 random draws)
Disturbed minus healthy, mean distance (14 vs 9)	+0.044	0	p = 0.26 (one-sided, 100,000 permutations)

Comparison	Observed	Expected by chance	Result
Pairs where the disturbed form lies farther from a ring than its healthy form	6 of 7	3.5 of 7	p = 0.06 (sign test, one-sided)

The seven pairs are: healthy alpha against Alzheimer alpha (0.17 → 0.29); physiological tremor against essential tremor (0.08 → 0.47) and against Parkinson tremor (0.08 → 0.16); resting heart rate against tachycardia (0.08 → 0.47); the gastric slow wave against bradygastria (0.12 → 0.46) and tachygastria (0.12 → 0.25); and breathing rate against tachypnea (0.39 → 0.03), the one pair that goes the other way.

The pair result is suggestive, not significant, and it was seen only after the data were laid out. Three pairs share one healthy reference (tremor) and two share another (gastric), so the seven are not independent. The calculation code and all inputs are reproducible from section 1 and the tables above.

8. Frequencies that treat: the proven line

Five frequency treatments have regulatory approval or large controlled trials behind them, and in each the frequency itself matters: the same device at another frequency works less or not at all.

Treatment	Condition	Frequency used	Depth, nearest ring, distance	Evidence	Sources
Deep brain stimulation, subthalamic nucleus	Parkinson's disease	about 130 Hz; benefit ceiling 130–185 Hz; 90, 130 and 170 Hz effective, 10 and 50 Hz not; 60–80 Hz tried for gait	130 Hz: 28.72, ring 29, 0.28	Standard care; controlled frequency comparisons	Dayal, Limousin & Foltynie 2017; Rizzone et al., JNNP
Repetitive TMS, left prefrontal	Treatment-resistant depression	10 Hz, 37.5 min per session	31.06, ring 31, 0.06	FDA-cleared; THREE-D trial, n = 414	THREE-D, Lancet 2018
Intermittent theta burst	Treatment-resistant depression	triplets at 50 Hz, repeated at 5 Hz, 2 s on and 8 s off; 3 min per session	50 Hz: 29.59, ring 30, 0.41; 5 Hz: 31.69, ring 32, 0.31	Non-inferior to 10 Hz rTMS (remission 32 % vs 27 %); accelerated form FDA-cleared	THREE-D; Front. Neurosci. 2021; Am J Psychiatry
Vagus nerve stimulation	Drug-resistant epilepsy	20–30 Hz, 30 s on and 5 min off; 1 Hz used as the low, near-placebo arm	20 Hz: 30.43, ring 30, 0.43	FDA 1997; responders 30 % at high vs 14 % at low setting	IntechOpen 2014

Treatment	Condition	Frequency used	Depth, nearest ring, distance	Evidence	Sources
Pulsed electromagnetic field	Fracture non-union	4.5 ms bursts of 225 µs pulses, repeated at 15 Hz, 1.8 mT peak, 10 h a day	15 Hz: 30.69, ring 31, 0.31	FDA 1979; 86–90 % healing in uncontrolled series by the manufacturer	Murray & Pethica 2016
Gamma sensory stimulation	Mild Alzheimer's disease	40 Hz light and sound, 1 h a day	29.80, ring 30, 0.20	Pilot RCT, n = 15	Chan 2022
TENS	Pain	low below 10 Hz; high above 50–100 Hz	bands, not single values	Many trials of low quality; effect size uncertain	Vance et al. 2022
Resonance breathing with heart-rate biofeedback	Stress, blood pressure, mood	4.5–7 breaths/min, most often 5.5	5.5/min: 35.33, ring 35, 0.33	Many small trials	Front. Public Health 2017
Transorbital alternating current	Optic nerve damage	8–25 Hz around the eyes	30.22–31.26	One RCT (n = 82); German ophthalmology societies judge the evidence insufficient	The Ophthalmologist; DOG/BVA 2016

Three mechanisms are known for these frequencies. In TENS, low and high frequencies act through different opioid receptors (µ and δ), and repeating one frequency builds tolerance that mixing frequencies prevents. In deep brain stimulation, high frequencies suppress the excess beta synchrony of section 3. In theta burst, the pattern copies the brain's own theta rhythm, which lets a 3-minute session match a 37.5-minute one.

The transorbital study needs a correction: the German ophthalmology society and the professional association of ophthalmologists found that its primary endpoint was changed after registration, the gain was not significant in the damaged part of the visual field ($p = 0.13$), and about 30 comparisons went uncorrected. They do not recommend the treatment.

9. Frequencies that treat: the Russian line

The Russian and Ukrainian tradition uses frequency devices widely in clinics, but its controlled evidence is thin: the one well-designed sham-controlled trial found here was negative.

Method	Use	Frequency	Depth, nearest ring, distance	Evidence	Sources
Millimetre-wave (EHF) therapy, after Devyatkov	Pain, joint disease, headache, neuropathy	30–70 GHz, fixed lines such as 42.25 and 53.5 GHz; up to 10 mW/cm²	42.25 GHz: 10.88, ring 11, 0.12; 53.5 GHz: 10.67, ring 11, 0.33	13 studies, 9 RCTs, only 3 of good quality	Usichenko et al. 2006
SCENAR, after Karasev (adaptive electrical stimulation)	Back and neck pain	90 Hz, adjusted by skin response	29.06, ring 29, 0.06	Single-blind sham RCT, n = 60: no difference from sham (p = 0.22)	Michel-Cherqui 2021
ALMAG magnetotherapy (travelling field)	Joint, nerve, vascular and lung conditions	e.g. 100 Hz at 20 mT; 79 programs	100 Hz: 28.96, ring 29, 0.04	Hospital series 2014–2020, no randomisation or blinding	Elamed report
Vitafon vibroacoustic microvibration	Blood pressure and circulation	carriers 30–60 Hz and 9–18 kHz; modulation 0.5–1.2 s; sweep 80–160 s	30 Hz: 30.06, ring 30, 0.06; 9 kHz: 24.87, ring 25, 0.13	Rat study, 6 per group	Sjecr 2014, as placed in Konstapel 2026
Therapy-frequency tables (Russian clinical lists, adjusted by Müller with Global Scaling)	Many conditions, one frequency each	varies per table	not placed	No blinded test of the frequency–disease pairing found	—

Two patterns stand out. First, the SCENAR (90 Hz) and ALMAG (100 Hz) frequencies lie very close to ring 29, closer than any Western approved frequency except 10 Hz rTMS; Vitafon's carrier range spans both an on-ring value (30 Hz) and an off-ring one (60 Hz). Second, the device whose frequency sits closest to a ring and that was properly tested, SCENAR, did no better than sham after one session. Ring position alone therefore does not make a treatment work; the theory's own rule is that the state must be read first, which none of these devices did in a recorded way.

The millimetre-wave band is the one place where the Russian line meets a prediction of the theory directly: its lines lie between rings 10.7 and 10.9, next to ring 11 (37.1 GHz), while the theory singles out ring 12 (12.37 GHz) as the most likely unnamed sense window. A comparison of 37.1, 12.37 and 42.25 GHz at equal absorbed power would test both at once.

10. Treatment frequencies on the ladder: the test

The frequencies that are proven to treat do not sit on rings: their mean distance is 0.285, slightly above the 0.25 expected by chance. Within the same device, the effective frequency is not the one closer to a ring.

Comparison	Observed	Expected by chance	Reading
Seven proven treatment frequencies (DBS 130, rTMS 10, iTBS 50 and 5, VNS 20, PEMF 15, gamma 40 Hz), mean distance	0.285	0.25	no closeness to rings (p = 0.74)
DBS: effective 90, 130, 170 Hz against ineffective 10, 50 Hz	0.27 against 0.23	equal	effective not closer
VNS: effective 20 Hz against low-effect 1 Hz	0.43 against 0.15	equal	effective farther
Russian devices SCENAR 90 Hz and ALMAG 100 Hz	0.06 and 0.04	0.25	close to ring 29, but SCENAR failed against sham

This is the most important result of the article for anyone who wants to build a device from the theory. A frequency chosen because it lies on a ring has, on present evidence, no advantage over a frequency found by trial. The theory itself predicts this outcome under one condition: when the receiving layer's state is not read, the same offering closes in some people and not in others, and group results flatten. The approved treatments were all developed without reading state. Whether ring frequencies win once state is read is untested; section 11 sets out how to test it.

11. From theory to device

The fastest decisive step is a ring-shift trial: take a device that already works, and compare its standard frequency with the nearest ring frequency under blinding, with the patient's state read before every session.

Design rules derived from the theory (from Konstapel 2026, *The Senses on the Ladder*):

1. **Read the state first.** Record resting heart rhythm (RR intervals) and the target rhythm before each session; the response depends on the state.
2. **Offer the layer's own ring.** The target is the ring on which the healthy form of the rhythm sits (sections 3–5), not the ring of the disturbance.
3. **Offer a nested triad.** f, f/3 and f/9 in sequence, because three passages at one ring form one passage of the ring above.
4. **Local or carried.** A rotating three-phase signal (three coils or electrodes at 0°, 120°, 240°) closes in place; three equal pulses carry the closure one layer up.
5. **Phase-lock the carrier.** A carrier on ring 25 (7,761.35 Hz) divides every ring frequency above it by an exact power of three, so each burst holds a whole number of carrier cycles.

6. **Leave silence.** After each offering, at least one period of the ring above without signal.
7. **Session length.** 92.4 minutes (ring 41), the length of the rest cycle.
8. **Never offer a ring-locked disturbance its own ring.** Absence seizures (ring 32) and Cheyne–Stokes breathing (ring 37) are rhythms already locked on a ring; stimulating that ring could reinforce them. People with epilepsy are excluded from any ring-32 offering.

Ring-shift trials on existing devices (each frequency lies inside the device's normal range):

Device and condition	Standard frequency	Ring frequency to compare	Primary outcome
rTMS, depression	10 Hz	10.65 Hz (ring 31)	Remission on HRSD-17
DBS, Parkinson's disease	130 Hz	95.8 Hz (ring 29)	UPDRS-III motor score, beta power
VNS, epilepsy	20 Hz	10.65 Hz (ring 31; ring 30 at 31.9 Hz lies above the 30 Hz device limit)	50 % responder rate
40 Hz light and sound, Alzheimer's disease	40 Hz	31.9 Hz (ring 30)	Alpha peak frequency, memory test
Resonance breathing, stress and blood pressure	5.5 per minute	7.9 per minute (ring 35)	HRV LF power, blood pressure

New-device hypotheses (to be tested only after the ring-shift trials, and only with safety review):

Disturbance	Healthy ring	Candidate offering	Measured outcome
Slowed alpha (early Alzheimer's disease)	31	Triad 10.65 / 3.55 / 1.18 Hz, carrier 7,761.35 Hz, 92-min sessions	Individual alpha frequency
Essential tremor	31	Same triad, three-phase applicator at the limb	Tremor frequency and amplitude (accelerometer)
Tachycardia at rest, autonomic imbalance	33	Triad 3.55 / 1.18 / 0.394 Hz, or paced breathing at 7.9/min	Resting heart rate, HRV
Gastric dysrhythmia	36	Abdominal offering at 0.0438 Hz (2.63 cpm) as the slow envelope	Electrogastrogram

Each row is fixed here before data. A ring frequency that fails to beat the standard frequency in a state-recorded, blinded trial counts against the device rule, not only against the device. For millimetre-wave devices the matching test is the comparison of 12.37, 37.1 and 42.25 GHz in section 9. Any medical device built from this programme falls under the EU Medical Device Regulation; nothing here is a treatment recommendation.

12. The microbiome

The gut bacteria are part of the body's rhythm system: their composition swings over the day with the host's eating, a disturbed day disturbs them, and the disturbance can be passed on to another animal with the bacteria alone.

12.1 The microbiome and the body's rhythms

- **A daily rhythm, set by eating.** In mice more than 15 % of bacterial groups and about 23 % of their metabolic pathways oscillate over 24 hours; in humans up to 10 % of groups. Restricting feeding to the light or the dark shifts the bacterial rhythm by about 12 hours (Thaiss et al. 2014, *Cell*; National Geographic).
- **Jet lag passes into the bacteria and back into the body.** Repeated 8-hour light shifts abolished the bacterial rhythm in mice, and the mice gained weight and lost glucose control; antibiotics prevented this. Bacteria from jet-lagged mice, and from two jet-lagged people, gave the same weight gain to germ-free mice. The human shift reversed within about two weeks (same sources; the human part rests on two volunteers).
- **The bacteria reach the brain through the vagus nerve.** In mice, the strain *Lactobacillus rhamnosus* JB-1 lowered stress hormone and anxiety- and depression-like behaviour and changed GABA receptors in the brain; none of this happened when the vagus nerve was cut (Bravo et al. 2011, *PNAS*; ScienceDaily).

In the terms of this article, the microbiome is a layer that closes on the host's day (ring 43.5) through the host's meals, and that carries a broken day into metabolism. The circadian imbalance of section 5, the one with no frequency of its own, therefore has a second carrier: the bacteria.

12.2 The bacteria's own rhythms on the ladder

Rhythm	Measured	Depth, nearest ring, distance	Sources
Flagellar motor, *E. coli*	hundreds of Hz when swimming; up to 300–400 Hz	100 Hz: 28.96; 300 Hz: 27.96, rings 28–29	Sowa & Berry 2008
Run and tumble, *E. coli*	runs about 1 s, tumbles about 0.1 s	33.15 and 31.06, rings 33 and 31	Princeton lecture notes
Electrical and growth oscillation, *Bacillus subtilis* biofilm	potassium waves, periods of hours	1–3 h: 40.6–41.6, around ring 41	Physics Today 2015; ScienceDaily
Circadian clock of cyanobacteria (KaiABC)	about 24 h, runs in a test tube with three proteins	43.50, between rings 43 and 44	GEN
Daily swing of the gut microbiome	24 h, set by host feeding	43.50	Thaiss 2014

Two readings follow, both cautious. The bacterial run-and-tumble and the host's heartbeat and alpha rhythm share rings 33 and 31; the biofilm's potassium oscillation sits near ring 41, the body's rest cycle. But run, tumble and motor values are round estimates of the order of magnitude, so their closeness to

rings is not evidence. The firm point is the 24-hour clock: bacteria that live in light keep it themselves, gut bacteria take it from the host, and both sit on the one rhythm that lies farthest from any ring.

12.3 What frequencies and fields do to bacteria

Claim or study	Frequency and strength	Finding	Status	Sources
Millimetre-wave resonance in *E. coli* (Belyaev)	51.755 and 51.674 GHz, from about 10^{-19} to 3 × 10^{-3} W/cm²	Narrow resonances, 3–100 MHz wide, change DNA conformation; the effect reverses sign between growing and resting cells	Repeated by one group; not independently confirmed	summary of Belyaev 1996; EMF-Portal, 2002 study
Weak fields of all kinds on *E. coli*	0–300 GHz, 85 % of experiments at ELF, 60 % at 50 Hz	Growth changed in 71–74 % of experiments, gene expression in 33–50 %	Systematic review: no correlation can be established; too few and too varied studies	Gdańsk University of Technology review
Bioelectric effect on biofilms	direct current below 100 µA/cm²	Lowers the antibiotic dose needed to kill biofilm bacteria to near that for free bacteria	Reproducible laboratory effect, 1994 onward	Costerton et al. 1994
Rife frequencies kill specific microbes	frequency per organism	—	No clinical trials found; cancer organisations reject the claims	Medical News Today

The millimetre-wave result matters most for this article for one reason: the same frequency did opposite things to growing and to resting cells. That is the theory's first rule, read the state first, seen in bacteria. It may also help explain why weak-field results on bacteria scatter so widely: if the sign of the effect depends on growth phase, studies that do not fix the phase will disagree.

12.4 Predictions for the microbiome

Prediction	Measurement	Refuted if
M1. Restoring a regular meal rhythm restores the microbiome's daily swing faster than any frequency offering	Stool samples every 4 h over 48 h, before and after 2 weeks of fixed meal times	No change in the share of oscillating groups
M2. Field effects on bacteria depend on growth phase, with opposite sign in growing and resting cultures	Same field, same strain, cultures in log and stationary phase, growth and gene expression measured blind	Same direction of effect in both phases
M3. A ring frequency (ring 11, 37.1 GHz) acts on bacteria at lower power than the off-ring Belyaev line (51.755 GHz)	Dose–response curves for both, growth phase fixed	No difference in threshold

No frequency treatment of the microbiome is proposed: the one lever with strong evidence is the timing of meals and light, which sets the bacteria's clock through the host.

13. Reading through the theory, and four predictions

The theory reads imbalance as drift: a layer whose rhythm no longer closes on its own ring. The group data cannot decide this, because rings shift between people and population ranges are wide. The predictions below therefore move from groups to individuals, where the theory says the reference belongs.

Three readings follow from the axioms and the pair pattern:

- **Drift, not a new ring.** Slowed alpha in Alzheimer's disease, essential tremor, tachycardia and the gastric dysrhythmias all move a healthy rhythm off its ring without landing on another. In the theory this is drift within the class, the state the theory says can still be retuned.
- **Locking on a neighbouring ring.** Absence seizures (0.10 from ring 32), Cheyne–Stokes breathing (0.04 from ring 37) and tachypnea (0.03 from ring 34) sit close to rings. In the theory a system can close firmly on the wrong layer; a strong, regular, unwanted rhythm is what such a closure would look like.
- **The day is the open remainder.** The solar day is the rhythm farthest from any ring (0.50). It is imposed from outside, by the Earth's rotation, and the body has to temper itself to it, much as the theory says every life tempers an open remainder. That circadian misalignment is the imbalance with the broadest disease link in this set (IARC Group 2A) fits this reading, but does not prove it.

Prediction	Measurement	Refuted if
P1. In one person, healthy rhythms sit closer to their own nearest rings than chance, when measured in that person rather than taken from population ranges	Per person: alpha peak, physiological tremor, resting heart rate, breathing and gastric rhythm at rest, each placed on the fixed hydrogen ladder	Mean distance in 30 or more healthy people is not below 0.25 (pre-registered, one-sided, 5 %)
P2. Within a person, the disturbed form lies farther from the ring than the same person's healthy form	Paired before and after onset, or on and off treatment: alpha in early Alzheimer's disease, tremor, gastric rhythm	Fewer than two thirds of pairs move away from the ring
P3. A treatment that restores function moves the rhythm back towards its ring	Parkinson beta and tremor on and off levodopa; gastric rhythm before and after prokinetic treatment	Clinical improvement without any shift towards a ring
P4. Ring-locked imbalances (absence seizures, Cheyne–Stokes breathing) are more regular than drift imbalances	Coefficient of variation of the period in each condition	No difference in regularity between the two groups

Each prediction is fixed here, before data, together with its refutation condition.

14. Limits and status

The main limit is that population ranges are wide on a ladder with a step of three, so a group-level test has little power to find closure on rings even if it exists.

- **Selection.** The 24 rhythms are those with a clear, citable frequency. Many imbalances of mind (depression, anxiety, psychosis) show changes in power, asymmetry or phase rather than a new frequency, and are not in the set.
- **Small numbers.** Nine healthy and fourteen disturbed rhythms give wide uncertainty; the pair test has seven pairs, not all independent.
- **Mixed measures.** Some rows are band limits set by convention (theta 4–8 Hz, HRV bands), not peaks found in data. They locate a band, not a rhythm.
- **Single sources.** The breathing range, tachypnea, the 90-minute cycle, seasonal depression, the IARC classification, the millimetre-wave frequencies, the VNS and PEMF parameters and the SCENAR and ALMAG data each rest on one opened page.
- **After the fact.** The pair pattern and the three readings in section 13 were formed after seeing the data. Only the predictions in sections 11, 12 and 13 are tests.

Statement	Status
Hydrogen units, ring formula, all depths and distances	Computed from CODATA 2018 inputs
The frequencies of the 24 rhythms	Measured by others; cited, most from two sources

Statement	Status
Healthy rhythms sit closer to rings than chance (group level)	Tested, not supported (p = 0.24)
Disturbed forms lie farther from rings than their healthy forms	Exploratory, 6 of 7 pairs (p = 0.06); found after the fact
Proven treatment frequencies sit on rings	Tested, not supported (p = 0.74)
Transorbital stimulation for optic nerve damage works	Disputed; not recommended by the German ophthalmology societies
Russian device evidence (millimetre-wave, SCENAR, ALMAG, Vitafon)	Weak: small or uncontrolled studies; one sham RCT negative
Gut bacteria oscillate daily, are disturbed by jet lag and signal to the brain through the vagus	Measured in mice; human data from two volunteers
Millimetre-wave resonances in *E. coli* that reverse with growth phase	Reported by one group; not independently confirmed
Imbalance as drift, ring-locking and the day as open remainder	Reading through the theory; not tested
Design rules for devices (section 11)	Derived from the theory; untested as a set
Ring-shift trials, new-device hypotheses, predictions P1–P4 and M1–M3	Predicted, untested; refutation conditions fixed
Any use of these frequencies for treatment outside a trial	None. Not medical advice

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