# The Cures That Do Not Fit

### A different picture of the human body, and what it makes possible

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## Three treatments that work for the wrong reasons

A cardiologist implants a pacemaker. Nothing about the molecular biology of the heart has been corrected. No receptor is blocked, no gene edited, no protein refolded, no cell replaced. A rhythm has been supplied from outside, and the patient lives — sometimes for decades.

A neurologist implants a stimulator in the subthalamic nucleus and gates it on beta-band power: current is delivered when synchrony rises and withdrawn when it falls. The dopaminergic neurons remain lost. The synuclein remains misfolded. The tremor stops.

A physiotherapist gives a patient with advanced Parkinson's disease a metronome, or a line taped across the floor. The patient, who a moment earlier could not initiate a step, walks. The intervention is a sound and a stripe. Its effect is immediate, and no molecule in that patient has changed.

These are not fringe treatments. They are licensed, funded, taught, and in daily use. And none of them fits the picture of the body that medicine officially holds.

That picture is the assembly: a body composed of parts, disease as a broken or missing part, treatment as repairing, blocking, removing or replacing it. It is an extraordinarily productive picture. Antibiotics, insulin, transplantation, monoclonal antibodies and most of modern surgery come out of it. Nobody proposes discarding it.

But when a treatment works by supplying a rhythm rather than fixing a part, the assembly picture has no place to put it. It files these cases as clever engineering — prostheses for a function, not evidence about the organism. That filing is a mistake. They are evidence, and what they are evidence for is a second picture, in which they are not exceptions at all but the first, crude instruments of a different medicine.

## The second picture

It comes from physics, and it is easiest to see in water.

A vortex ring — a smoke ring, a bubble ring blown by a dolphin — has a definite identity. It has a size, a lifetime, a direction of travel; you can point at it; it can bounce off things and survive. Yet there is nothing it is made of that is not also the surrounding water. It has no parts. It is a persisting pattern in a medium, not an object placed into empty space.

Modern vacuum physics points the same way about matter itself. The vacuum is not emptiness but a structured medium with measurable properties, and a particle is better described as a stable knot in that medium than as a small hard thing sitting in nothing. On this reading, matter is frozen topology, and the constants that govern how things interact are not universal givens but properties of the local state of the medium — they can differ where the medium differs.

Now apply that to a body, and the consequence arrives immediately, because it is a fact every biochemist already knows and rarely dwells on: almost nothing in a person persists. The proteins turn over in hours to days. The gut lining is replaced weekly, the skin monthly, the skeleton over years. The atoms in a body are, on any reasonable timescale, borrowed. In the assembly picture this is an awkward curiosity — the assembly is continually rebuilt from different bricks and somehow stays itself. In the pattern picture it is the entire point. **The person is the pattern. The molecules are what the pattern happens to be written in this week.**

That single move changes what a body *is*. Not a machine made of components that occasionally break, but a nested set of self-maintaining patterns — a basin within a basin within a basin, from organelle to cell to tissue to organism — each held in place not by its material but by its coupling to the others. Health is the maintenance of that coupling. Disease is what happens when a basin can no longer hold its shape, and the molecular lesion is the visible mark of the failure rather than its origin.

This is not mysticism, and it is not new to biology in spirit — Claude Bernard's *milieu intérieur*, Cannon's homeostasis and Wiener's cybernetics all gesture at it. What the physics adds is that the same description runs all the way down, and that the medium is not a metaphor.

# The body has three faces, and medicine measures all three

If an organism is a maintained pattern, then three things about it are measurable, and each already has instruments.

**Form.** The configurations that fix identity. DNA is the strict case: the linking number of closed double-stranded DNA is a conserved integer, and an entire enzyme family — the topoisomerases — exists to change it. Chromosome conformation capture now measures genome folding directly, and in cancer a tumour can arise not because a gene is mutated but because a folding boundary is lost and an enhancer reaches a gene it should never have contacted. In neurodegeneration the same register dominates: cryo-electron microscopy has resolved the tau filament folds of Alzheimer's disease, and distinct tauopathies turn out to correspond to distinct folds of the *same* protein. In Parkinson's disease, seed amplification assays detect not the presence of α-synuclein but the capacity of one conformation to template itself onto others. In every case the material is unremarkable and the arrangement is the disease.

**Rhythm.** The coupled oscillations that keep the parts one system. Parkinson's disease is defined electrophysiologically by excessive beta-band synchrony; Alzheimer's disease by the loss of gamma. Mitochondria are not power units but coupled, flickering oscillators, and their membrane potential — around 150 millivolts across five nanometres, a field of roughly ten million volts per metre — is among the strongest in biology. The heart's rhythm entrains the breath at roughly four to one. Plamen Ivanov's network physiology has shown that each physiological state, waking or light sleep or deep sleep, has its own recognisable topology of organ-to-organ interaction, and that transitions between states are visible as reconfigurations of that network within seconds.

**Medium.** The state of the material that carries the coupling. Palpation is the oldest cancer test there is; elastography is its quantitative descendant. And stiffness is not merely a consequence of a tumour but a driver of it — increased matrix crosslinking promotes malignant progression, and reducing the crosslinking reduces the progression. In neurodegeneration the medium moves the other way: brain tissue softens. The electrical dimension is instrumented too. Michael Levin's group has shown in amphibians that imposed depolarisation produces tumour-like structures with no oncogenic mutation at all, and that repolarisation suppresses tumours that oncogenes did produce.

To this register belong the tissues usually treated as packing material — collagen, fascia, interstitial fluid, the ordered water at macromolecular surfaces. In the assembly picture they are scaffolding. In the pattern picture they are the wiring.

Nothing here is unpublished. All of it is standard, in three literatures that do not read each other. The claim is only that these are not three subjects. They are three faces of one state.

# Why this should matter to someone who treats patients

Four consequences follow, and they are practical rather than philosophical.

**The register we can steer is not the register we aim at.** Rhythm can be driven: pacemakers, adaptive stimulation, sensory entrainment, rhythmic cueing. Medium can be driven: crosslinking inhibition, mechanical loading, bioelectric manipulation. Form, at present, we can mostly only break — topoisomerase inhibitors, the largest clinical intervention in that register, work by damaging the substrate. Yet almost all pharmacotherapy aims at form. If the three registers are one state, then two-thirds of the available control surface is currently classified as adjunctive.

**Opposite failures need opposite treatments, and the sign matters.** Coupling can fail by falling away and by locking up. Sepsis is the decoupling of biological oscillators; atrial fibrillation is desynchronisation; early type 2 diabetes shows reduced islet synchrony. Parkinson's disease and epilepsy are the opposite — pathological synchrony, the system trapped in a rigid state. An intervention that restores coupling is not a milder version of one that suppresses it; it is its inverse, and given to the wrong patient it should be expected to do harm. In the organ-based classification these two live in different chapters and no one notices they are the same axis.

**Prevention becomes possible where it currently is not.** This is the largest consequence. If coherence fails before the lesion appears, then the failure is measurable while there is still nothing to biopsy. Parkinson's disease already has such a window: people with isolated REM sleep behaviour disorder convert to a synucleinopathy at high rates, over years to decades, and are already under follow-up in several cohorts. Rhythm and medium in those people can be measured non-invasively and repeatedly. If they depart from their set point before seeding activity becomes detectable, then screening changes character — from finding a lesion early to finding a departure before there is a lesion. The same logic applies to fields of tissue at elevated cancer risk, where the question is whether stiffening and depolarisation precede clonal expansion.

**The pacemaker principle generalises.** A pacemaker does not correct a cause. It supplies a stable external reference and lets the system re-organise around it. Once that is seen as a principle rather than a cardiac trick, a class of interventions comes into view: rhythmic cueing in movement disorders, light and temperature cycling for circadian repair, paced breathing, regular loading of tissue, the deliberate protection of sleep. These are not lifestyle advice appended after the real treatment. In the pattern picture they are interventions on coupling strength — which is to say, on the thing that fails first.

# How this could be wrong

The claim that can fail is about order. Conventional accounts hold that the molecular lesion comes first and the changes in rhythm and tissue follow from it. This reading holds the reverse.

That is decidable, and with instruments that already exist. In a prodromal cohort, measure all three registers on the same people over the same years: serial seed amplification for form, quantitative EEG with autonomic measures for rhythm, elastography for medium. If the molecular signal arrives first and the others trail it, the inversion is wrong in its strong form and this picture retreats to the modest claim that context modulates a process it does not originate.

One trap has to be avoided in that design. Whichever register is measured most sensitively will appear to move first, for reasons that have nothing to do with biology. The way past it is to predict not merely the order but the gradient: if the early departure is causal, its magnitude should predict how long the later one takes to arrive. A difference in instrument sensitivity produces a constant offset. A causal lead produces a slope.

# What is actually being proposed

Not that molecular medicine is wrong. Genes matter, proteins matter, cells matter. What changes is their position: components of a maintained pattern rather than the ultimate causes of what happens to it.

And not that a new instrument is needed. That is the striking part. The scanners are installed, the assays are validated, the stimulators are already implanted in patients, and the cohorts are already under follow-up. Every measurement this picture requires is being made somewhere in the building this week, by people who file it under three different headings and publish it in three sets of journals.

What is missing is the picture that reads them together — and the reason to want it is not elegance. It is that in the assembly picture you can only intervene once a part has broken, while in the pattern picture the failure is visible, and reachable, while the parts are all still intact.

The three treatments this essay opened with are what that medicine looks like when it is arrived at by accident. There is no reason it has to keep being accidental.

## Sources and further reading

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*The physical framework is developed in the author's work on fractal context dynamics and the vacuum condensate; the clinical framework in the Coherence Medicine papers. Both are available at constable.blog and on ResearchGate.*