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The Problem We are Solving
for is the Conservation of
High Quality, Long Lives

The Physical Laws Framework

A Foundation for Healthcare Transformation

What is Physical Laws Framework

The Physical Laws Framework (PLF) is a groundbreaking evaluation methodology that applies fundamental biological principles to assess healthcare policies, financing mechanisms, and delivery systems. Built on Nobel laureate Erwin Schrödinger's insights that "living organisms must obey strict physical laws," PLF provides healthcare leaders with scientific tools to predict policy outcomes and optimize system performance.

The Problem We are Solving for: Conservation of High Quality, Long Lives

Healthcare policy evaluation traditionally relies on economic models, political feasibility studies, and administrative metrics that ignore the biological realities of human health. This disconnect creates:

- **Predictable Policy Failures:** Systems designed without biological grounding produce poor outcomes despite significant investment
- **Health Disparities:** Policies that violate physical laws disproportionately harm marginalized populations
- **Resource Waste:** Billions spent on interventions that work against natural healing processes
- **Innovation Barriers:** Breakthrough medical advances trapped in administratively convenient but biologically misaligned systems

How Does PLF Work?

PLF aligns medical systems with the fundamental physical laws governing all biological processes—from atoms and molecules to cells, organs, and entire human bodies.

PLF recognizes that health disparities and poor outcomes occur when healthcare systems violate these physical laws through administrative barriers, fragmented care, poor timing, and failure to address social determinants that disrupt biological order.

By implementing PLF's six core principles—Conservation of Biological Order, Energetic Efficiency, Information Transfer Fidelity, Temporal Alignment, and Equilibrium Restoration—healthcare systems can work with rather than against the body's inherent capacity for healing, creating more effective and equitable care for all communities.

Introduction to PLF

The following slides are intended as an introduction to the PLF. PLF underlies all of our work at NMQF. It's not just another healthcare model or a temporary initiative – it's a fundamental scientific approach that will transform how we understand and address the delivery of healthcare.

What makes this framework so powerful is that it's built on universal principles – the same physical laws that govern all living things. These aren't arbitrary or changeable policies, but the immutable laws of biology itself. By aligning our healthcare approaches with these physical laws, we create solutions that work with, rather than against, the laws from which life emerges.

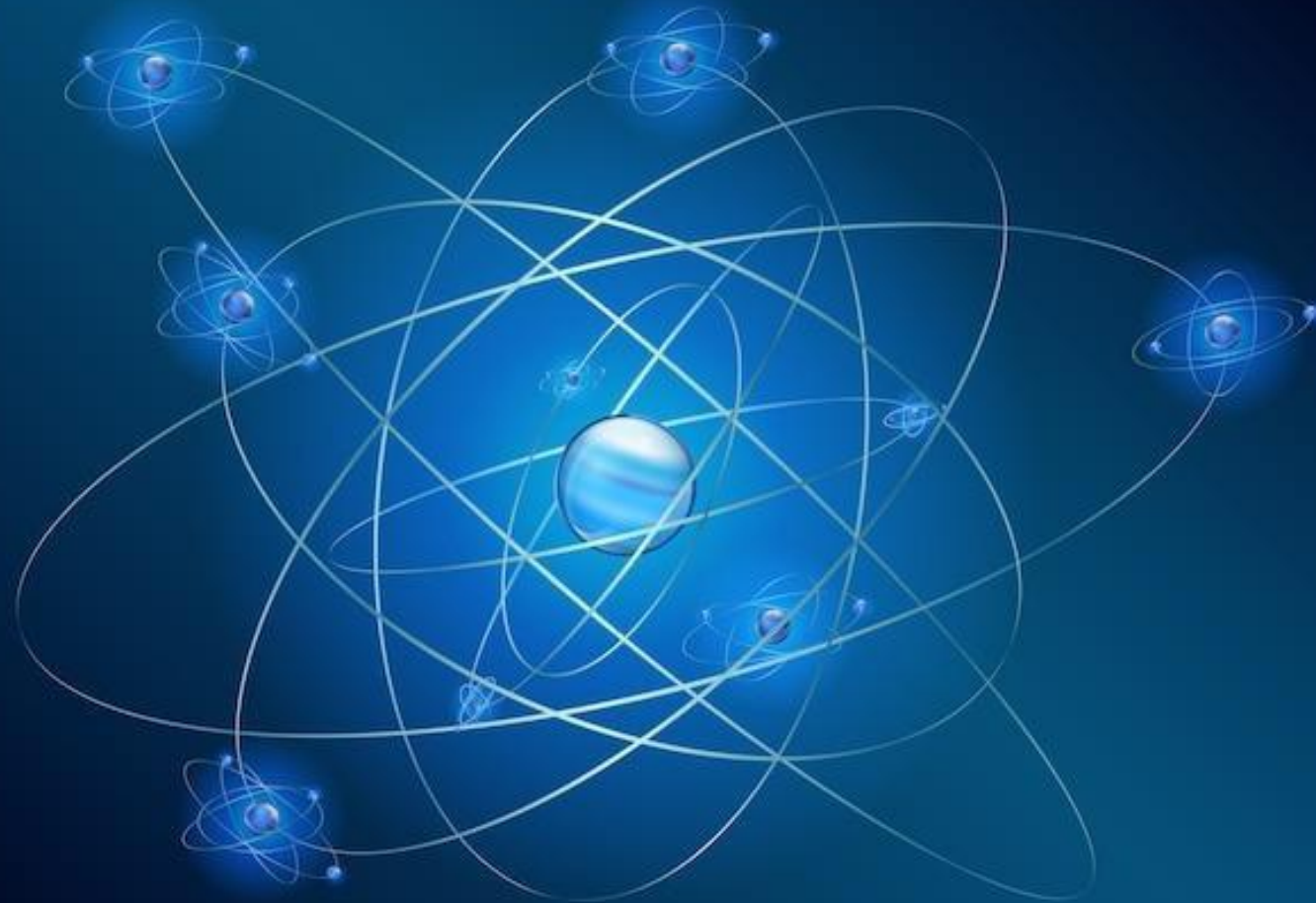




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Atoms

**The Building Blocks of
Everything**



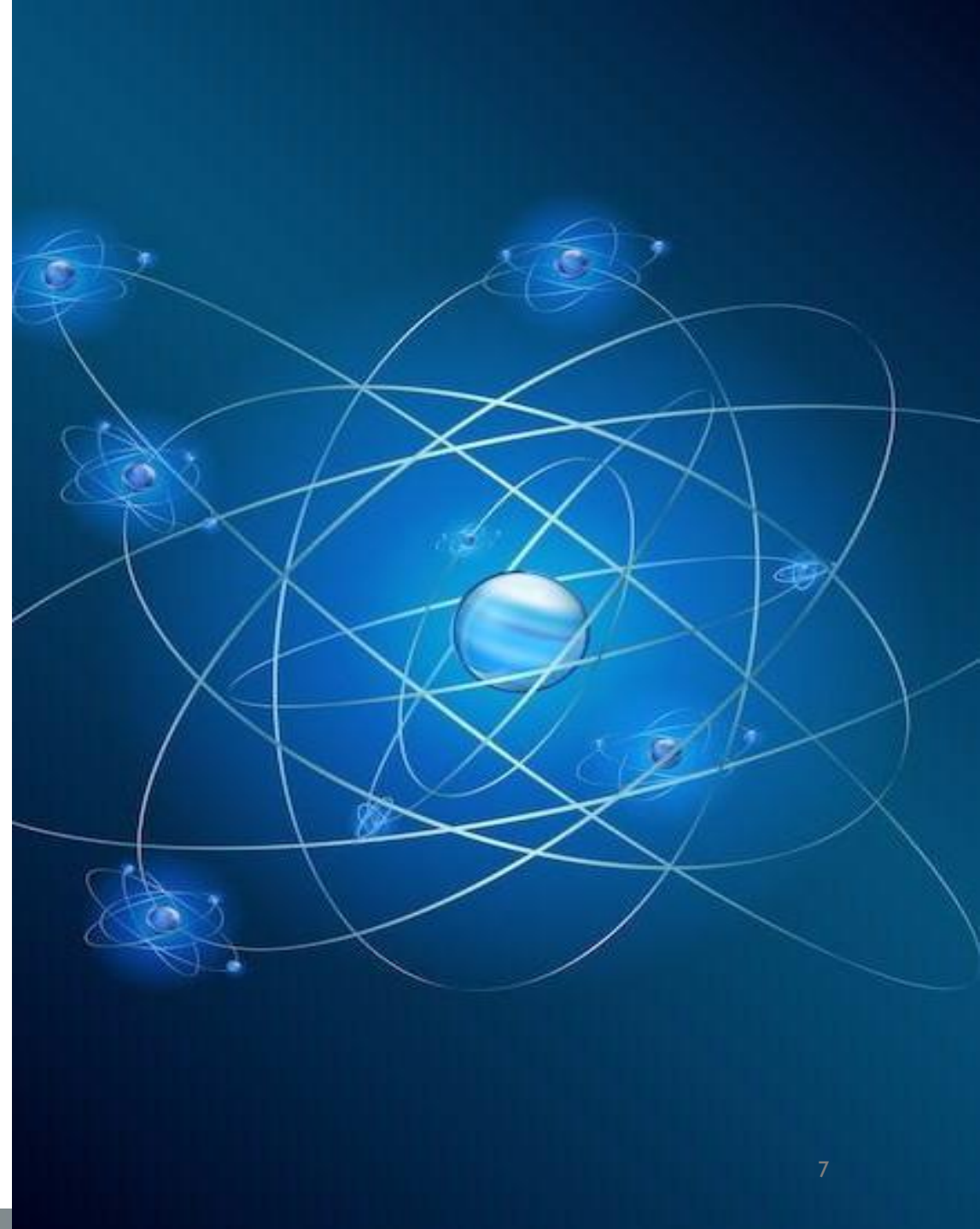
Atoms

To understand PLF, we need to start at the foundational level: atoms. All matter in our universe – galaxies, stars, sand, our bodies – is made of atoms. These tiny units do not interact randomly or chaotically; they follow precise physical laws that determine exactly how they bind to form complex systems.

When atoms come together following these laws, they form molecules – the building blocks of all biological structures. This isn't chance or magic – it is chemistry governed by physical laws.

Here is something remarkable to consider: just four types of atoms – carbon, hydrogen, oxygen, and nitrogen – make up 96% of your body. Every thought you have, every movement you make, every heartbeat depends on these atoms following exact physical laws.

When healthcare systems violate these fundamental laws, they work against the very nature of our biology. PLF recognizes that effective healthcare must align with these physical processes rather than disrupt them.



What Makes Life Possible?

"How can the events in space and time which take place within the spatial boundary of a living organism be accounted for by physics and chemistry?"

- Nobel Laureate physicist Erwin Schrödinger in 1943

The Big Question

The Big Question

In simple terms, Schrödinger was asking: What makes life different from non-life? How do living things maintain their incredible complexity and order when the universe tends toward disorder?

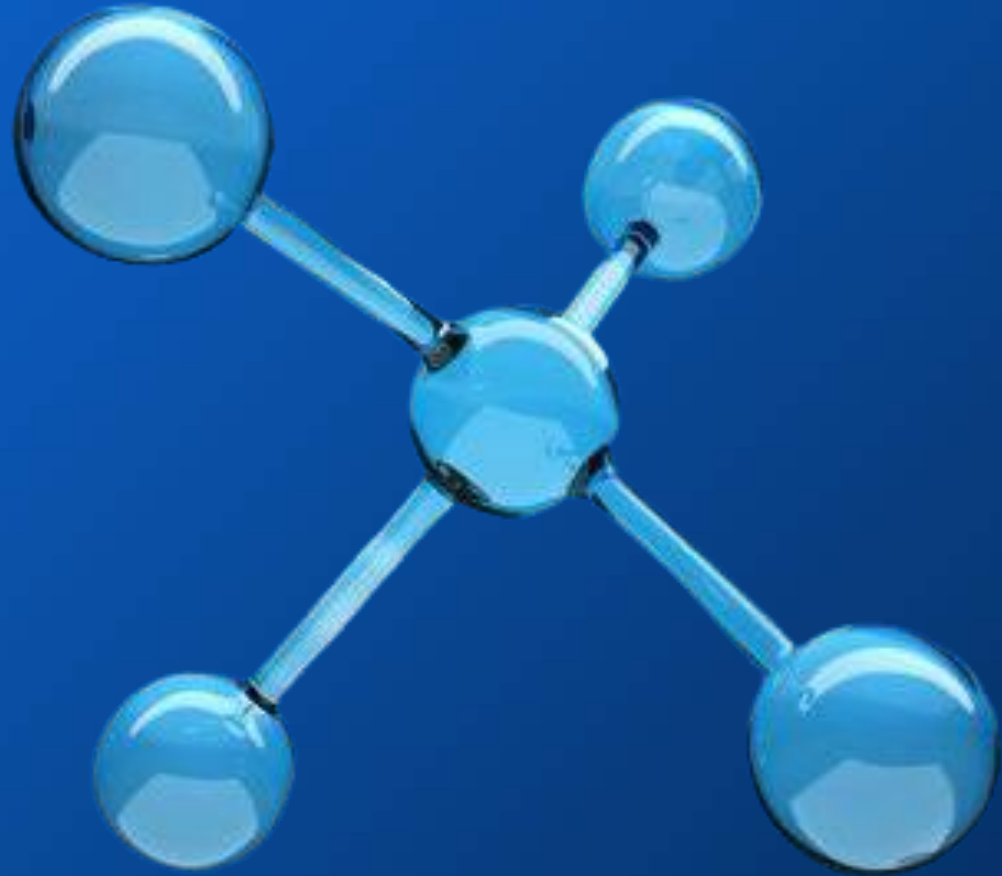
His conclusion was revolutionary. He determined that there are exact physical laws that explain why living organisms are living. These are not vague or metaphorical principles – they are precise natural laws that govern everything from the smallest cell to the most complex human body.

What's remarkable is that these laws operate at all scales simultaneously. The same principles govern atoms, molecules, cells, tissues, organs, and entire organisms. When we understand these laws, we gain powerful insights into both health and disease - and how healthcare should be structured.



From Atoms to Molecules

Life's Complexity Emerges



When atoms combine following physical laws, they create the incredible diversity of molecules that make life possible. Let's look at three examples that show the remarkable organization and purpose we see at the molecular level.

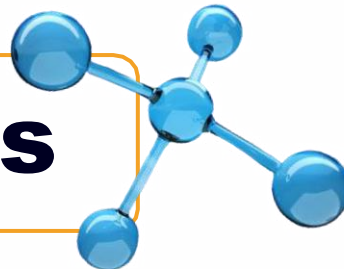
First, water - the simple H_2O molecule. It's essential for all cellular processes and makes up about 60% of your body. The unique properties of water – its polarity, its ability to form hydrogen bonds, its role as a universal solvent – aren't random. They follow directly from physical laws and make life possible.

Second, proteins - the workhorses of our cells. These complex molecules are built from amino acids following precise sequences encoded in our DNA. Each protein has a specific three-dimensional shape that determines its function – whether it's an enzyme digesting your food, an antibody protecting you from infection, or hemoglobin carrying oxygen through your bloodstream.

Third, DNA itself - the magnificent molecule that carries our genetic code. The double helix structure of DNA, the complementary base pairing, the mechanisms of replication – all follow from physical laws that ensure information is preserved and transferred accurately.

The key insight from our framework is that healthcare must recognize and work with these molecular processes, not disrupt them. Whether it's medication timing, treatment sequencing, or care coordination, effective healthcare aligns with the molecular foundations of life.

From Atoms to Molecules



Where Physical Laws Create Life

Cells: Life's Basic Units

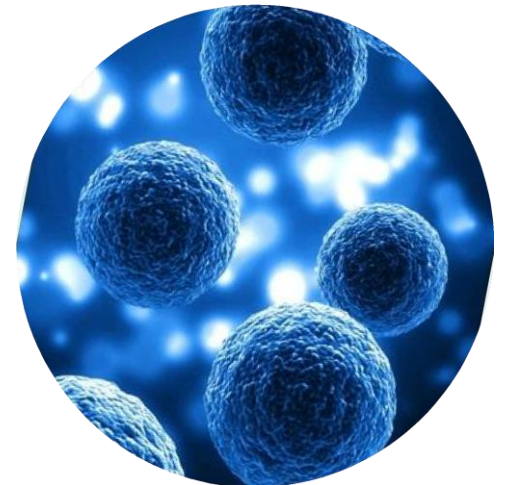
Now we move to the cellular level – where the miracle of life becomes visible. Cells are the basic units of all living organisms, the smallest structures that can be considered truly alive.

The human body contains approximately 30 trillion cells, each one a marvel of organization. Inside each tiny cell are billions of molecules working together in precise coordination. This isn't random – it's a beautiful example of physical laws creating and maintaining order.

One of the most fascinating aspects of cells is how they maintain internal order despite the universe's tendency toward disorder. According to the Second Law of Thermodynamics, systems naturally become more disorganized over time. But cells actively work against this tendency, using energy to create and maintain their complex internal structures.

This points to something critical for healthcare: disease often represents a breakdown in this cellular order. When cells cannot maintain their organization – whether due to genetic factors, environmental toxins, or resource limitations – health suffers. Effective healthcare must therefore focus on supporting and restoring proper cellular order, not just treating symptoms.

Cells: Life's Basic Units



At the heart of PLF is a bedrock axiom: life is a constant battle between order and disorder. The physical principle at work here is entropy - the natural tendency of all systems to become more disordered over time. Every living organism on Earth fights against entropy.

Your body is constantly working to maintain precise order at the molecular and cellular level. This is not optional – it's essential for life itself. When this order fails to form, or breaks down beyond a certain point, we have described those conditions as disease, aging, disability. When order breaks down completely, death follows.

How do living systems maintain order in a universe that tends toward disorder? They do it by using energy according to specific physical laws. Every cell in your body consumes energy to maintain its internal structure, repair damage, and perform its functions. This process follows exact principles that cannot be violated without consequences. This gives us a powerful new way to understand health and disease. Health is not just the absence of symptoms – it's the successful maintenance of biological order across all systems in the body. Disease is not just the presence of symptoms - it's the breakdown of order in one or more biological systems.

For healthcare to be truly effective, it must recognize this fundamental battle and work to support the body's natural order-maintaining processes, not disrupt them.

The Fundamental Battle: Order vs. Disorder



The True Purpose of Healthcare

Sustaining Biological Order

An understanding of biological order gives us a revolutionary insight into the true purpose of healthcare. At its most basic level, healthcare's mission is to maintain biological order and prevent disorder. Everything else – symptoms, treatments, interventions – must serve this core purpose.

Yet our traditional healthcare system often loses sight of this mission. Instead of focusing primarily on maintaining biological order, it prioritizes financial metrics, efficiency measures, and symptom management. These are not inherently wrong, but they're secondary to the primary purpose of maintaining and restoring biological order.

PLF's approach is different. It recognizes that truly effective healthcare must align with the physical laws that govern life itself. This means organizing our systems, measurements, and interventions around the maintenance and restoration of biological order. This shifts our priorities in a fundamental way. Rather than focusing primarily on financial risk management – trying to minimize costs while achieving acceptable outcomes – we focus on patient risk mitigation – trying to minimize disruptions to biological order while using resources efficiently.

This is not just a philosophical distinction; it leads to entirely different approaches in practice. With biological order at the center of PLF, healthcare systems work with, rather than against, the fundamental nature of life.



The Current Healthcare System Problem

Violation of Physical Laws

As come to understand the importance of biological order, we can see that many problems in our current healthcare system stem from violations of fundamental physical laws. These are not minor issues – they are serious misalignments that prevent optimal health outcomes, especially in marginalized communities.

Consider how delayed access to treatments disrupts biological timing. Many disease processes follow specific timelines, with critical windows for intervention. When administrative barriers, insurance requirements, or capacity limitations delay care, they don't just inconvenience patients – they violate the temporal requirements of biological processes.

Similarly, fragmented care creates information disorder. In biology, information must flow accurately and completely between cells and systems. When healthcare information is siloed, incomplete, or inconsistent, it creates disorder that directly impacts health outcomes. Financial barriers present another violation. When effective treatments are unavailable due to cost concerns, this prevents the restoration of biological order that would otherwise be possible. The physical laws governing biology do not change based on insurance status or income level.

The result is predictable patterns of poor health outcomes in marginalized communities. These aren't random or inevitable – they are the direct result of healthcare systems that violate fundamental physical laws. By recognizing these violations, we can design interventions that restore proper alignment with natural laws.

Through the lens of PFL, health disparities take on new meaning. They aren't random variations or inevitable differences – they're visible evidence of system disorder. They reveal where healthcare systems most severely violate the physical laws needed for biological order.

Look at the patterns we see in marginalized communities: higher rates of late-stage cancer diagnoses, limited access to effective treatments, underrepresentation in clinical studies, and poor outcomes that correlate with socioeconomic factors. These aren't separate problems – they are interconnected manifestations of the same fundamental issue: system disorder that violates physical laws.

Late-stage diagnoses reflect violations of temporal alignment – interventions happening too late in disease progression. Limited treatment access represents energy barriers – making it unnecessarily difficult to obtain care that could restore biological order. Underrepresentation in clinical studies creates information gaps that perpetuate disorder.

The framework helps us see that these patterns are not just unfortunate – they're predictable results of systems that are not aligned with physical laws. And if they are predictable, they are preventable. By realigning healthcare with these fundamental laws, we can disrupt these patterns and create more equitable health outcomes.

Health Disparities: System Disorder Made Visible



Six Key Principles of the Physical Laws Framework

PLF is built around six key principles, each drawn from fundamental physical laws that govern biological systems:

- First, Conservation of Biological Order. This principle recognizes that healthcare must preserve or restore the precise ordering of biological systems at all levels – from molecular to cellular to organ system.
- Second, Energetic Efficiency. This principle acknowledges that biological processes require energy, and healthcare should minimize unnecessary energy expenditure for patients while ensuring they have the resources needed for health.
- Third, Information Transfer Fidelity. This principle reflects how biological systems depend on accurate information flow, and healthcare must similarly ensure high-quality information transfer between all components.
- Fourth, Temporal Alignment. This principle recognizes that biological processes operate on specific timescales, and healthcare interventions must synchronize with these natural rhythms.
- Fifth, Equilibrium Restoration. This principle acknowledges that health represents a state of dynamic balance, and healthcare should aim to restore this equilibrium when it's disrupted by disease.
- Sixth, Environmental Foundation Integrity. This principle recognizes that optimal biological function requires precise environmental conditions—clean air, pure water, nutritious food, stable housing, and reliable transportation. Healthcare systems must address environmental determinants as primary biological necessities rather than secondary social considerations.

These [six principles](#) are not separate – they're interconnected aspects of a unified approach. Together, they provide a comprehensive framework for transforming healthcare delivery, especially in marginalized communities.

Conservation of Biological Order

First Principle of Physical Laws Framework

Conservation of Biological Order ensures healthcare interventions preserve or restore the precise molecular and cellular organization necessary for optimal physiological function. Disease represents a breakdown of normal biochemical pathways, protein folding, gene expression patterns, and cellular communication networks. Healthcare policies that disrupt this restoration process—through fragmented care that interrupts treatment protocols, delayed access that allows pathological processes to progress beyond reversible stages, or suboptimal interventions that fail to address root molecular dysfunction—violate fundamental principles of pathophysiology and create measurable deterioration in biomarkers, functional status, and clinical outcomes..

Energetic Efficiency

Second Principle of Physical Laws Framework

Energetic Efficiency recognizes that cellular metabolism requires precise energy allocation to maintain homeostasis, repair tissue damage, and support immune function. Disease states already impose significant metabolic stress through inflammatory cascades, protein synthesis demands, and cellular repair processes. Healthcare systems must minimize additional physiological stress by eliminating administrative barriers that activate the hypothalamic-pituitary-adrenal axis, elevate cortisol levels, and divert metabolic resources from healing toward stress response mechanisms. When patients expend energy navigating bureaucratic obstacles—experiencing anxiety over coverage denials, delays in treatment authorization, or complex prior approval processes—they trigger sympathetic nervous system activation that impairs wound healing, suppresses immune function, and prolongs recovery times. Clinical evidence demonstrates that psychological stress measurably reduces lymphocyte proliferation, delays tissue repair, and increases susceptibility to infection, directly contradicting the energetic requirements for optimal biological recovery.



Information Transfer Fidelity

Third Principle of Physical Laws Framework

Information Transfer Fidelity acknowledges that biological systems depend on accurate signal transduction, neurotransmitter function, hormone regulation, and genetic transcription for proper physiological coordination. Healthcare delivery must mirror this precision through high-fidelity clinical information transfer between providers, ensuring continuity of medication management, accurate transmission of diagnostic results, and seamless communication of treatment modifications. Information gaps or transmission errors create clinical discontinuities analogous to synaptic dysfunction, leading to medication errors, duplicated testing, contraindicated treatments, and therapeutic delays that compromise patient safety and treatment effectiveness.



Temporal Alignment

Fourth Principle of Physical Laws Framework

Temporal Alignment respects that biological processes operate on specific, non-negotiable pharmacokinetic and pharmacodynamic timescales. Therapeutic windows for intervention—such as thrombolytic therapy for stroke, antibiotic initiation for sepsis, or insulin management for diabetic ketoacidosis—are determined by underlying pathophysiology, not administrative convenience. Healthcare delivery must synchronize with these critical timeframes, as delays beyond therapeutic windows result in irreversible tissue damage, treatment resistance, or disease progression that dramatically alters clinical prognosis and functional outcomes.



Equilibrium Restoration

The Fifth Principle of Physical Laws Framework

Equilibrium Restoration focuses healthcare interventions on reestablishing disturbed physiological homeostasis through evidence-based therapeutic modalities that address underlying pathophysiology. Disease states represent deviations from normal biochemical equilibria—altered pH balance, electrolyte disturbances, hormonal dysregulation, or immune system dysfunction. Policies that prioritize non-clinical considerations over restoring these fundamental biological balances create persistent pathophysiological stress, chronic inflammatory states, and progressive organ dysfunction that manifests as worsening clinical parameters and increased morbidity.



Environmental Foundation Integrity

Six Principle of Physical Laws Framework

Environmental Foundation Integrity recognizes that optimal cellular metabolism, immune function, and organ system performance require precise environmental conditions including adequate oxygenation, proper hydration, essential micronutrients, stable housing that prevents infectious disease exposure, and reliable access to medical care. These environmental factors directly influence gene expression through epigenetic mechanisms, affect gut microbiome composition, and determine exposure to environmental toxins that can disrupt endocrine function and cellular repair processes. Healthcare systems must address these determinants as primary biological necessities, as deficiencies in air quality, water purity, nutrition, or housing stability create measurable impacts on biomarkers, disease susceptibility, and treatment response rates.

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The Path Forward

Transforming Healthcare Through Physical Laws Framework

Healthcare systems currently violate fundamental physical laws at every level:

- Administrative barriers drain patients' healing energy through prior authorizations and coverage denials
- Social determinants create chronic stress that disrupts biological order
- Fragmented care prevents proper information flow between systems
- Delayed treatments ignore the temporal requirements of biology
- Symptom management replaces true equilibrium restoration

When healthcare aligns with PLF's six physical laws principles:

- Conservation of Biological Order - Systems preserve rather than disrupt natural healing processes
- Energetic Efficiency - Patients direct energy toward healing, not navigating barriers or compensating for environmental deficiencies
- Information Transfer Fidelity - Accurate communication flows like in healthy biological systems
- Temporal Alignment - Interventions synchronize with natural biological timing
- Equilibrium Restoration - True balance is achieved, not just temporary relief
- Environmental Foundation Integrity - Essential environmental conditions support optimal biological function rather than creating additional biological stress

The question is not whether we can afford to implement PLF—it's whether we can unlock our true human potential in a system that undermines that potential





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Thank you

Physical Laws Framework