When Finding Nothing Matters Most: A Deranged Guide to Medical Overinvestigation

ABSTRACT

Background: Modern healthcare faces a profound paradox that would make Kafka weep with envy: the well-intentioned pursuit of early detection increasingly harms patients through unnecessary diagnoses and treatments, transforming medical vigilance into a source of iatrogenic injury. Yes, reader, we have managed to weaponize thoroughness itself. **Objective:** To dissect the phenomenon of medical overinvestigation through paradigmatic clinical examples and illuminate evidence-based pathways toward more judicious diagnostic practices—a task roughly equivalent to teaching restraint to a toddler in a candy store. **Methods:** This analysis synthesizes contemporary evidence on overinvestigation, examining two exemplary clinical scenarios that epitomize the problem: a rectal "patch" discovered during digital examination (spoiler alert: it's probably nothing) and an asymptomatic, non-reproducible systolic murmur in a 66-year-old male (spoiler alert: still probably nothing). **Results:** Global research reveals that overinvestigation afflicts millions, with overdiagnosis rates spanning **12.6%** to **60%** across conditions—a range so broad it suggests either profound scientific uncertainty or that someone, somewhere, is making these numbers up. Healthcare systems hemorrhage up to $**200 billion** annually on unnecessary testing alone, which could alternatively fund approximately 40,000 well-equipped intensive care units. Digital rectal examination demonstrates abysmal diagnostic performance—pooled sensitivity of merely 0.51 and specificity of 0.59 for prostate cancer detection, making it roughly as accurate as consulting a Magic 8-Ball. **Conclusions:** Recognizing when clinical findings warrant restraint rather than investigation—and cultivating the wisdom to act upon this recognition—represents a fundamental requirement for delivering truly patient-centered care. This is harder than it sounds.

Keywords: overinvestigation, overdiagnosis, medical overuse, diagnostic testing, healthcare quality, patient safety, diagnostic humility

1. Introduction: The Art of Medical Restraint

In the pantheon of medical iatrogenesis, few phenomena prove as insidious as overinvestigation—the performance of diagnostic tests when the probability of discovering actionable pathology remains vanishingly small. H. Gilbert Welch, whose pioneering work illuminated this shadowy realm of modern medicine (and whose name sounds suspiciously like that of a Victorian-era

physician who might have prescribed cocaine for melancholy), captures its essence with crystalline clarity:

> *"The diagnosis of a condition that, if left undetected, would not have caused symptoms or harm to a patient during their lifetime."*

Well. There you have it. We have become so proficient at finding disease that we've started inventing it—a medical equivalent of discovering new planets that turn out to be dust specks on the telescope lens.

This deceptively simple definition masks a complex trinity of interconnected harms that follows a progression as predictable as the stages of grief:

- **Overinvestigation**: the relentless pursuit of diagnostic certainty where uncertainty would serve patients better (the medical equivalent of asking "Are we there yet?" every five minutes during a cross-country drive)
- **Overdiagnosis**: the detection of biological anomalies that masquerade as disease but lack clinical significance (finding shadows that turn out to be, well, shadows)
- **Overtreatment**: the cascade of interventions that follow, each building upon the last in a crescendo of unnecessary care (the medical equivalent of using a sledgehammer to hang a picture frame)

Consider two clinical vignettes that, in their very ordinariness, illuminate the extraordinary scope of this problem. These seemingly innocuous findings will thread through our analysis like persistent background music in a department store—omnipresent, mildly irritating, and surprisingly influential in shaping behavior.

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2. Theoretical Framework: The Expanding Boundaries of Disease

2.1 The Architecture of Excess

Understanding overinvestigation requires examining the confluence of forces that transform clinical judgment into reflexive testing—a process roughly as elegant as watching democracy in action. Like tributaries feeding a mighty river (or like multiple streams of pharmaceutical advertising feeding a mighty revenue stream), multiple currents converge to create this phenomenon, each reinforcing the others in a self-perpetuating cycle of diagnostic excess.

2.1.1 The Technological Imperative

At medicine's heart lies a seductive fallacy as old as the first stethoscope: if technology can peer deeper into the human body, surely it should. This technological imperative marries human curiosity with increasingly sophisticated instruments that can detect molecular whispers of abnormality—findings so subtle that previous generations of physicians would never have encountered them, much like how our ancestors never worried about their Wi-Fi signal strength.

Yet sensitivity without specificity becomes a burden, creating a universe of pseudo-diseases that exist only in the realm of diagnostic possibility. It's rather like having a smoke detector so sensitive that it's triggered by burnt toast, steaming coffee, and the mere suggestion of thermal energy.

2.1.2 The Economics of Overuse

Healthcare's financial architecture actively rewards the very behaviors that harm patients—a perverse irony that would make Hippocrates reach for the hemlock. Fee-for-service systems create incentives where additional testing translates directly into revenue, regardless of clinical utility. In this inverted moral economy, restraint becomes financial self-sabotage, while diagnostic excess flourishes as sound business practice.

One imagines Adam Smith rolling in his grave, having never anticipated that his invisible hand would develop such an enthusiasm for unnecessary colonoscopies.

2.1.3 The Shield of Defensive Medicine

Malpractice litigation casts a long shadow over clinical decision-making, transforming physicians into defensive players in a high-stakes game where any missed diagnosis could spell professional ruin. This medicolegal anxiety drives clinicians toward the false safety of "complete" workups, as if thoroughness could insulate against the fundamental uncertainty that defines medical practice.

It's the medical equivalent of wearing both a belt and suspenders while standing in a bunker—technically safer, but perhaps missing the point entirely.

2.1.4 The Cultural Mythology of More

Perhaps most insidious of all is the cultural belief that equates medical intensity with medical quality—the notion that "more medicine equals better medicine." This mythology permeates both physician training and patient expectations, creating a shared delusion that comprehensive testing represents comprehensive care.

This would be roughly equivalent to judging a restaurant's quality by the length of its menu, which admittedly might explain the enduring popularity of certain chain establishments.

2.2 Scope and Impact

Ray Moynihan and colleagues describe this as part of "too much medicine," a systemic problem involving:

- Overdetection of indolent disease (finding sleeping dogs and then poking them with sticks)
- Overdefinition through expanding disease criteria (redefining normal as pathological with the enthusiasm of a zealous customs agent)
- Overmedicalisation of normal life processes (because apparently aging, sadness, and the occasional snore now require intervention)

Key Statistics That Should Alarm Any Rational Human:

- **40-60%** of diagnostic tests performed during hospitalization are unnecessary (roughly equivalent to half of all medical decisions being wrong)
- Up to **20%** of total healthcare spending may represent low-value care (a waste that would make government accountants blush)
- **99%** of physicians report experiencing diagnostic cascades firsthand (making this roughly as common as regret after a late-night online shopping spree)
- Low-value care services cost the U.S. healthcare system $**75-100 billion** annually (Grimshaw et al., 2020)—roughly the GDP of a medium-sized European nation spent on medical activities that help no one
- The *Choosing Wisely* campaign has identified over 700 overused tests and treatments across 80+ medical specialties in 20+ countries (Cliff et al., 2021)—a global epidemic of good intentions gone wrong

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3. Clinical Case Studies: When Routine Examinations Become Harmful Investigations

3.1 Case Study 1: The Phantom Menace of the Rectal "Patch"

Consider the quotidian moment: a routine physical examination, the physician's gloved finger detecting what feels like a subtle textural irregularity during digital rectal examination. In an instant, this unremarkable finding—a "patch," perhaps a variation in tissue consistency that could be anything from a normal anatomical variant to the aftermath of last Tuesday's spicy burrito—transforms from clinical observation into potential harbinger of malignancy.

Yet this transformation represents not medical acuity but diagnostic alchemy, transmuting the base metal of normal anatomical variation into the fool's gold of pathological concern. It's

rather like mistaking a cloud for a UFO—technically possible, but statistically unlikely and probably embarrassing in retrospect.

3.1.1 The Diagnostic Mirage

Digital rectal examination stands as perhaps the most striking example of a diagnostic test that persists despite overwhelming evidence of its futility—a medical tradition with roughly the same evidence base as bloodletting, but with less impressive historical costumes. A landmark 2018 systematic review and meta-analysis published in the *Annals of Family Medicine*, encompassing 9,241 patients across seven primary care studies, delivers a devastating verdict on this hallowed practice with the clinical precision of a pathologist and the brutal honesty of a teenager (Naji et al., 2018).

The numbers tell a sobering story of misplaced confidence that would make a weather forecaster envious:

Metric	Value	Clinical Significance
Pooled Sensitivity	0.51 (95% CI: 0.36-0.67)	Performance barely distinguishable from random chance (coin flip, anyone?)
Pooled Specificity	0.59 (95% CI: 0.41-0.76)	More likely to mislead than illuminate (crystal ball territory)
Positive Predictive Value	0.41 (95% CI: 0.31-0.52)	Less than half of "positive" findings represent actual cancer (worse odds than roulette)
Negative Predictive Value	0.64 (95% CI: 0.58-0.70)	One-third of "normal" exams miss existing malignancy (Miss rate that would get you fired from quality control)

These metrics reveal a diagnostic tool so fundamentally flawed that its continued use defies rational medical practice—rather like using a sundial to time Olympic swimming events.

3.1.2 The Voice of Evidence

Professional consensus has crystallized around this test's fundamental inadequacy with the kind of clarity typically reserved for acknowledging that water is wet. The U.S. Preventive Services Task Force delivers its verdict with rare institutional honesty:

> *"The use of digital rectal examination as a screening modality is not recommended because there is a lack of evidence on the benefits."*

This recommendation represents more than bureaucratic caution—it embodies a recognition that medicine's most hallowed traditions can become its most harmful practices when divorced from evidence. It's the medical equivalent of finally admitting that just because your grandfather did something doesn't make it a good idea.

3.2 Case Study 2: The Elusive Symphony of the Non-Reproducible Murmur

Now imagine a different clinical moment: the stethoscope pressed against an elderly chest, capturing what seems like a faint systolic murmur that vanishes upon repeat examination like a shy woodland creature. This acoustic specter—present one moment, absent the next—exemplifies how the aging heart's benign adaptations can be misconstrued as pathological signals demanding investigation.

It's rather like hearing a suspicious noise in your house at night that turns out to be the refrigerator settling, except with more expensive consequences.

3.2.1 The Epidemiology of Normal Aging

The systolic murmur in elderly patients represents one of medicine's most common false alarms—a biological equivalent of car alarms that sound whenever a butterfly lands on the hood. These sounds, far from being harbingers of cardiac doom, typically reflect the heart's natural response to decades of faithful service:

- **Ubiquity**: Nearly one-third of septuagenarians harbor these acoustic artifacts (making them roughly as common as opinions about the weather)
- **Benign Origins**: The vast majority emanate from aortic sclerosis—a stiffening of cardiac structures that represents aging, not disease (like wrinkles, but internal and audible)
- **Temporal Progression**: From affecting one-quarter of those over 65 to nearly half of those over 85, these findings increase in lockstep with longevity itself (correlation that would make statisticians weep with joy)

3.2.2 The Wisdom of Restraint

Professional societies have responded to this epidemiological reality with clarity born of evidence and perhaps a touch of exasperation. The American Society of Echocardiography's *Choosing Wisely* initiative articulates a principle that challenges medicine's reflexive investigative impulses:

> *"Don't repeat echocardiograms in asymptomatic patients with murmur/click and no significant pathology."*

This recommendation embodies a profound clinical truth that would have been obvious to physicians of previous generations: that the absence of symptoms in the presence of common age-related findings should inspire restraint, not investigation. The skilled clinician recognizes that these transient acoustic phenomena require no technological validation—only the wisdom to distinguish the echoes of normal aging from the authentic sounds of disease.

Unfortunately, this wisdom appears to be in shorter supply than common sense at a political rally.

3.3 Case Study 3: The Thyroid Nodule Epidemic

Modern medical imaging has birthed an entirely new category of pseudo-disease: the incidentally discovered thyroid nodule—a finding so common it's practically become a rite of passage for anyone unfortunate enough to undergo CT scanning of the neck. A paradigmatic example emerges from the epidemic of thyroid cancer overdiagnosis, where sophisticated imaging technology transforms benign anatomical variations into sources of lifelong medical anxiety with the efficiency of a factory assembly line.

Recent physician surveys reveal that even specialists acknowledge this phenomenon with the weary resignation of parents admitting their teenager might be difficult, with **77%** of endocrinologists and **69%** of surgeons recognizing that low-risk papillary thyroid cancers are frequently overdiagnosed (Dedhia et al., 2022). This represents the rare medical consensus equivalent to agreeing that reality television might not represent actual reality.

3.3.1 The Anatomy of an Epidemic

The thyroid "cancer" epidemic represents one of medicine's most striking examples of technology-driven overdiagnosis—a masterclass in how to transform normal anatomical variation into a source of existential dread:

- **Incidence Inflation**: Thyroid cancer rates have tripled over the past three decades, with virtually all increases attributable to small papillary cancers—a rate of growth that would make cryptocurrency investors envious
- **Mortality Paradox**: Despite this dramatic rise in "cancer" detection, thyroid cancer mortality has remained essentially unchanged, rather like detecting an increasing number of "dangerous" clouds while lightning strikes remain constant
- **Autopsy Reality**: Post-mortem studies reveal that up to **36%** of adults harbor microscopic thyroid cancers that never caused symptoms or death, meaning more than one in three people die with thyroid cancer, not from it

This disconnect between detection and meaningful disease exemplifies how modern medicine's enhanced ability to find abnormalities can paradoxically worsen patient outcomes through unnecessary intervention—rather like using a microscope to examine every grain of sand on a beach and then declaring a geological emergency.

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4. The Cascade of Unintended Consequences

4.1 The Psychological Aftermath: When Uncertainty Becomes Suffering

The harms of overinvestigation extend far beyond laboratory bills and imaging reports—they penetrate the very psyche of patients, transforming individuals into chronic worriers haunted

by the specter of undetected disease. This psychological warfare begins with a simple abnormal result and can persist long after medical attention has moved elsewhere, like an unwelcome houseguest who never quite gets the hint.

4.1.1 The Persistence of Medical Trauma

Consider the woman who receives a false-positive mammogram: research reveals that her psychological distress may endure for **three full years**, far outlasting any memory of the actual screening experience (von Euler-Chelpin et al., 2016). Three years! That's longer than most Hollywood marriages and roughly equivalent to a full presidential campaign cycle of worry.

Norwegian physicians, intimately familiar with the human cost of overinvestigation (and presumably experts on enduring anxiety, given their proximity to perpetual darkness for half the year), have identified "enduring anxiety" as the most pernicious consequence they witness—a corrosive worry that infiltrates every aspect of patients' lives like humidity in Florida.

This anxiety manifests in profound ways that mock medicine's intention to heal:

- **Sleep disruption**: Nights fractured by worry over findings that were never clinically significant (insomnia courtesy of medical thoroughness)
- **Sexual dysfunction**: Intimacy compromised by a newly heightened awareness of bodily frailty (nothing quite kills the mood like wondering if that strange sensation is "the cancer spreading")
- **Identity transformation**: The psychological shift from "healthy person" to "person with potential disease"—a metamorphosis that can prove irreversible even when tests ultimately prove normal (rather like being unable to unsee a horror movie)

4.2 Physical Complications

4.2.1 Procedural Risks

False-positive results commonly trigger invasive follow-up testing with complication rates that would make Russian roulette seem like a reasonable leisure activity:

Screening Context	False Positives	Unnecessary Biopsies	Complication Rate
Breast Cancer (10,000 women)	5,000	1,000	Significant enough to matter

Common Complications:

- Pneumothorax from lung biopsies because who doesn't enjoy a collapsed lung as a bonus?
- Hemorrhage requiring intervention—bleeding is still not a feature
- Cellulitis requiring hospitalization
- Surgical debridement of surgical complications—meta-medicine at its finest

- Rare but documented deaths

4.3 The Cascade Effect

4.3.1 Amplification of Harm

- **Physician Experience**: **99%** report experiencing diagnostic cascades firsthand—making this roughly as universal as having regretted a text message
- **Frequency**: **30%** encounter meaningless cascades monthly, about as often as someone complains about the weather
- **Downstream Effects**: Patients receiving low-value MRI for back pain are 14 percentage points more likely to experience cascade events because apparently back pain needed to be more complicated

4.4 Economic Impact

4.4.1 Healthcare Costs

Cost Category	Annual Impact (USD)
Low-value care services	$**75-100 billion**—roughly the GDP of a medium-sized European nation
False-positive mammograms and overdiagnosis	$**4 billion**—enough to buy every American a really nice coffee
Total unnecessary diagnostic testing	Up to $**200 billion**, or approximately one Jeff Bezos

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5. Evidence-Based Strategies: Building Systems That Value Restraint

5.1 The Choosing Wisely Campaign (Teaching Doctors to Say No)

The *Choosing Wisely* campaign represents medicine's most comprehensive attempt to confront the epidemic of overuse through professional self-regulation—a global initiative that has achieved the remarkable feat of getting physicians to voluntarily admit they might be overdoing things (Cliff et al., 2021; Ganguli et al., 2021):

5.1.1 Global Reach and Impact

- **80+** medical specialty societies engaged worldwide
- **20+** countries implementing national campaigns because overinvestigation is apparently a universal human tendency

- **700+** specific overused tests and treatments identified—a list longer than most people's streaming queues
- **Evidence Base**: Systematic reviews demonstrate measurable reductions in low-value care where interventions are implemented

5.1.2 Measurable Outcomes

Recent analyses reveal the campaign's tangible benefits with the enthusiasm of accountants discovering a tax loophole:

- Significant reductions in unnecessary laboratory testing in hospitals implementing targeted interventions (Yeshoua et al., 2023)
- Decreased ordering of low-value imaging studies in primary care settings
- Enhanced physician awareness of the economic and clinical costs of overuse (Henderson et al., 2020)

5.2 The Art of Therapeutic Conversation

5.2.1 A Symphony in Three Movements

Effective shared decision-making unfolds like a carefully orchestrated conversation, each movement building upon the last to create a comprehensive understanding between physician and patient:

1. **Choice Talk**: The gentle revelation that medical decisions rarely offer only one path—that alternatives exist even when tradition suggests otherwise (groundbreaking concept: options exist)
2. **Option Talk**: The careful explication of benefits and harms, presented not as advocacy for any particular course but as honest illumination of trade-offs (radical transparency in action)
3. **Decision Talk**: The collaborative exploration of patient values and preferences, recognizing that the "right" choice emerges from the intersection of evidence and individual circumstance (imagine that—involving patients in their own care)

5.2.2 Reframing Medical Narrative

The language we use shapes the choices patients make, much like how describing airplane food as a "meal" shapes expectations. Rather than perpetuating the mythology that equates testing with thoroughness, clinicians must learn to articulate counter-intuitive truths:

- *"The most thorough care sometimes means avoiding tests that can't help you"* (medical restraint as excellence)
- *"Medical wisdom often lies in knowing when not to look"* (strategic ignorance as clinical skill)

5.3 Risk Stratification Model

5.3.1 Threshold Concepts

- **Testing Threshold**: Probability below which no investigation is warranted (the line between curiosity and clinical judgment)
- **Treatment Threshold**: Probability above which treatment should begin (when action becomes appropriate)

For both case studies presented, the probability of significant pathology falls well below any reasonable testing threshold—roughly equivalent to worrying about shark attacks while living in Montana.

5.4 System-Level Interventions

5.4.1 Technology Solutions

- Clinical decision support integrated into electronic health records (teaching computers to be voice of reason)
- Real-time guidance on appropriate testing protocols (like having a medical conscience built into the software)

5.4.2 Quality Improvement

- Plan-Do-Study-Act cycles (the PDSA cycle: bureaucracy that actually helps)
- Audit and feedback mechanisms (peer pressure for good)
- Peer review processes (professional accountability without public humiliation)

5.4.3 Payment Reform

Critical Strategy: Moving from fee-for-service to value-based models removes financial incentives for unnecessary testing—a concept so revolutionary it's been proposed for only the last two decades.

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6. Educational and Cultural Transformation

6.1 Medical Education Reform

6.1.1 Curriculum Integration

- High-value care principles in medical schools (revolutionary idea: teach cost-effectiveness)
- Teaching diagnostic reasoning and evidence interpretation (critical thinking in medical education—imagine that)

- Developing comfort with diagnostic uncertainty (embracing ambiguity in a profession that abhors it)

6.1.2 Continuing Medical Education

Focus areas for practicing clinicians who somehow missed this in their initial training:

- Diagnostic reasoning enhancement (thinking before testing)
- Evidence interpretation skills (statistics that actually matter)
- Communication techniques for discussing restraint (the art of therapeutic non-action)

6.2 Cultural Change Requirements

The traditional medical maxim *"first, do no harm"* takes on new meaning when diagnostic tests themselves can cause harm through overdiagnosis and cascading interventions. Perhaps it's time to add a corollary: *"sometimes, doing nothing is doing something."*

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7. Clinical Application and Future Directions

7.1 The Clinical Encounter Reimagined

When faced with our paradigmatic 66-year-old patient bearing these incidental findings, the skilled clinician must orchestrate a different kind of medical encounter—one that resists the gravitational pull of technological investigation in favor of therapeutic wisdom:

1. **The Education of Restraint**: Explaining not just what will not be done, but why this restraint represents the highest form of medical care—a teaching moment that transforms patient anxiety into understanding (radical concept: education as intervention)

1. **The Alchemy of Reassurance**: Managing the profound human fear that "missed" findings represent missed opportunities, helping patients understand that some stones are better left unturned (wisdom that would have been obvious to physicians who lacked CT scanners)

1. **The Focus on What Matters**: Redirecting clinical attention toward interventions with proven benefit—the unglamorous but effective measures that genuinely extend healthspan (like exercise, which remains stubbornly un-patentable)

1. **The Courage of Conviction**: Developing the professional fortitude to withstand both technological temptation and patient pressure, recognizing that true clinical leadership sometimes requires saying "no" to requests that masquerade as medical thoroughness (backbone as clinical skill)

7.2 Future Research Priorities

- Development of validated risk stratification tools (better mathematics for better decisions)
- Long-term outcomes studies of restrained vs. aggressive diagnostic approaches (evidence for restraint)
- Economic modeling of healthcare system benefits from reduced overinvestigation (proving that less can cost less)
- Patient preference studies regarding diagnostic uncertainty (what patients actually want vs. what we think they want)

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8. Conclusions

The examination of these seemingly trivial clinical findings—a textural irregularity felt during routine rectal examination, an evanescent heart murmur heard only once—reveals a profound truth about contemporary medicine that would be hilarious if it weren't so tragic: our greatest diagnostic failures often stem not from missing disease, but from finding problems that were never meant to be found.

It's rather like having such sophisticated security cameras that they detect every dust particle as a potential intruder, leading to constant false alarms that eventually render the entire system useless—except with higher stakes and more expensive consequences.

The evidence stands as an indictment of reflexive investigation that would make prosecuting attorneys envious in its comprehensiveness. When we pursue these phantom abnormalities with the full arsenal of modern diagnostics, we violate medicine's most sacred principle—*primum non nocere*—while squandering resources that could address genuine human suffering. Each unnecessary test becomes a stone cast into still waters, creating ripples of anxiety, complications, and further testing that can extend far beyond the original clinical encounter like the world's most expensive and least entertaining game of medical dominoes.

Yet recognizing this problem represents only the beginning of wisdom—roughly equivalent to acknowledging that you have a drinking problem while standing in a liquor store. Successfully addressing medical overinvestigation demands nothing less than a transformation of medical culture itself—a shift from the seductive mythology of comprehensive evaluation toward the more demanding discipline of judicious restraint. This transformation requires physicians to develop comfort with uncertainty (a skill roughly as natural to doctors as vegetarianism is to carnivores), patients to understand that less can indeed be more (counterintuitive in a culture that supersizes everything), and healthcare systems to reward value rather than volume (revolutionary thinking in American healthcare).

The ultimate challenge confronting modern medicine lies not in perfecting our ability to peer ever deeper into the human body, but in cultivating the wisdom to recognize when our gaze itself becomes the source of harm. In this recognition lies the promise of a medicine that truly serves patients—one that understands that sometimes the most profound healing occurs when clinicians possess the courage to do nothing at all.
And if that's not a revolutionary concept in modern medicine, then perhaps we need to examine our collective head.

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