POLIS V12: The Complete Medicine Series – 12 Giants

Jorge Batista Alves Pereira
Independent Researcher, Sabugal, Guarda, Portugal
ORCID: 0009-0000-6385-7245

May 2026

This document combines two companion papers:
"Tensional Reinterpretation of Six Founders of Western Medicine"
and "Tensional Reinterpretation of Six More Medical Pioneers".

All DOIs are marked as pending. Final DOIs will be inserted after Zenodo registration.

POLIS V12 – Tensional Reinterpretation of Six Founders of Western Medicine Jorge Batista Alves Pereira
Independent Researcher, Sabugal, Guarda, Portugal
ORCID: 0009-0000-6385-7245 May 2026

Abstract

Within the POLIS V12 tensional ontology, every medical system is a polis constituted by three meshes (solid, liquid, gaseous) and governed by the closure condition $\epsilon = \sum K_m(2 + K_m) = 0$, with $T = K_{\min}$ as the tensional origin. This paper applies the framework to six foundational figures of medicine: Hippocrates (humoral theory), Galen (physiology and anatomy), Avicenna (Canon of Medicine), Andreas Vesalius (modern anatomy), William Harvey (blood circulation), and Edward Jenner (vaccination). Each classical contribution is reinterpreted as a tensional configuration: the four humours as balanced K values; Galen's three spirits as meshes; Avicenna's regimen as IDT* management; Vesalius's dissections as solid mesh mapping; Harvey's circulation as liquid mesh flux; and Jenner's vaccination as Phase 5 immune training. The universal equations remain unchanged; no free parameters are introduced.

1 Introduction

POLIS V12 is a closed, parameter-free tensional conservation theory built on four axioms (Tensional Ontology, Harmonic Ground $H = 1$, Tensional Conservation, Data Origin $T = K_{\min}$). The governing equation, after normalisation, is

$$\epsilon = \sum_{m=1}^{n} K_m(2 + K_m) = 0,$$

with $K_m = (v_m - T)/(v_{\max} - T) \in [0, 1]$. The disequilibrium index is $\text{IDT}^* = \epsilon/(1 + \epsilon)$. All real medical systems reside in Phase 4 ($\text{IDT}^* \geq 0.70$) unless artificially uniform. The Rolling Law $2\pi r_p = V_{\text{orb}} T_{\text{rot}}$ applies fractally at all scales.

This paper reinterprets six key medical contributions within this tensional ontology. No classical primacy is assumed; tension is the primitive.

2 Hippocrates – Humoral Theory

Hippocrates proposed that health depends on balance of four humours: blood, phlegm, yellow bile, black bile. In POLIS V12, each humour corresponds to a normalised structural value K_i. Health is the condition where the sum of residuals is minimised.

For a patient, measure the relative abundance of each humour h_i. Set $T = \min(h_i)$ and $v_{\max} = \max(h_i)$. Then

$$K_i = \frac{h_i - T}{v_{\max} - T}, \qquad x_i = K_i(2 + K_i).$$

The total tensional residual is $\epsilon = \sum x_i$. Health corresponds to ϵ close to zero. Disease occurs when one humour dominates (e.g., yellow bile excess = choleric temperament =

high K_{yellow}). Treatment (bloodletting, diet) aims to restore balance by reducing the high K or increasing the low ones – a Phase 5 reorganisation.

3 Galen – Physiology and the Three Spirits

Galen described three spirits: natural (liver), vital (heart), animal (brain). In POLIS V12, these are the three meshes: solid (natural spirit = metabolic anchor), liquid (vital spirit = blood flow), gaseous (animal spirit = nervous signals). Galen's "faculties" (attractive, retentive, etc.) are tensional fluxes $VT = K - T$ across organ boundaries.

For an organ, define its function f as a normalised value over a healthy range. The organ's health K_{organ} determines its contribution to ϵ. Galen's therapeutic approach (opposite humour or quality) is equivalent to applying a tensional counter-flux: if K is too high, add a substance with low K (cold/moist) to lower the residual.

4 Avicenna – Canon of Medicine and Regimen

Avicenna's *Canon* systematised diagnosis, treatment, and preventive medicine. In POLIS V12, the Canon is a comprehensive collection of normalisation protocols. Avicenna's "signs" (pulse, urine, stool) are measured values v_m that are normalised to K_m.

For a patient, compute the overall IDT* from all signs. Avicenna's regimen (diet, exercise, sleep) is designed to reduce IDT* over time. His "simple drugs" are substances with known K_{drug} that modify the patient's K_{organ} when ingested. The Canon's classification of diseases is a hierarchical clustering of K anomaly patterns.

5 Andreas Vesalius – Modern Anatomy

Vesalius performed systematic dissections, correcting Galen's errors. In POLIS V12, anatomy is the mapping of the solid mesh of the human polis. Each organ is a sub-polis with its own K_{organ} based on structure and function.

Vesalius's *De Humani Corporis Fabrica* is a high-resolution map of the solid mesh. The discovery that Galen's descriptions were based on animals (different K_{organ} distributions) showed that normalisation must be species-specific. Vesalius's work is a re-normalisation of human anatomy: new T and $v_{\max}$ values for each organ.

6 William Harvey – Blood Circulation

Harvey demonstrated that blood circulates, not generated anew. In POLIS V12, blood circulation is the liquid mesh flow. The heart is a pump that maintains the tensional flux $VT = K - T$ throughout the circulatory network.

For a segment of the circulation, define pressure p as v. Normalise pressure to $K_p = (p - T_p)/(v_{\max,p} - T_p)$. The flow rate is proportional to ΔK_p (pressure gradient). Harvey's

calculation of cardiac output (a few litres per hour, not gallons) is a tensional verification: the total residual of blood over time must be conserved ($\epsilon = 0$ for a closed circulatory loop).

7 Edward Jenner – Vaccination

Jenner discovered that inoculation with cowpox protects against smallpox. In POLIS V12, vaccination is a Phase 5 immune reorganisation: a harmless antigen (low K_{pathogen}) is introduced, training the liquid mesh (immune system) to recognise the pathogen's K signature without causing a Phase 4 explosion.

For the immune system, define K_{memory} after exposure. Jenner's cowpox had $K_{\text{cowpox}} \approx K_{\text{smallpox}}$ but slightly lower. When the real smallpox (high K) arrives, the immune system's IDT* is already low, so the response is rapid and controlled. Vaccination reduces the ϵ of the host–pathogen system.

8 Conclusion

The six foundational contributions to medicine are coherently reinterpreted within the POLIS V12 tensional ontology. Humoral theory, physiology, anatomy, circulation, and vaccination all become natural consequences of the closure condition $\epsilon = \sum K_m(2+K_m) = 0$ and the fractal hierarchy of medical polises. No free parameters are added.

Zenodo references (pending)

- Main treatise: [Zenodo DOI pending]
- POLIS Bible: [Zenodo DOI pending]

POLIS V12 – Tensional Reinterpretation of Six More Medical Pioneers Jorge Batista Alves Pereira

Independent Researcher, Sabugal, Guarda, Portugal
ORCID: 0009-0000-6385-7245 May 2026

Abstract

This paper extends the POLIS V12 tensional reinterpretation to six additional medical giants: Ignaz Semmelweis (handwashing), Louis Pasteur (germ theory of medicine), Robert Koch (Koch's postulates), Alexander Fleming (penicillin), Florence Nightingale (statistics in medicine), and Paul Ehrlich (chemotherapy). Each is re-read as a tensional configuration: Semmelweis's handwashing as reducing external K; Pasteur's germ theory as identification of external polis; Koch's postulates as causal IDT* criteria; Fleming's penicillin as targeted reduction of pathogen K; Nightingale's statistical analysis as IDT* monitoring; and Ehrlich's magic bullet as selective tensional coupling. The universal equations remain unchanged; no free parameters are introduced.

9 Introduction

As in the companion paper, POLIS V12 rests on four axioms. After normalisation the mother equation is

$$\epsilon = \sum_{m=1}^{n} K_m(2 + K_m) = 0,$$

with $\text{IDT}^* = \epsilon/(1+\epsilon)$. All real medical systems are in Phase 4 ($\text{IDT}^* \geq 0.70$) unless artificially uniform. The Rolling Law $2\pi r_p = V_{\text{orb}} T_{\text{rot}}$ applies fractally.

This paper reinterprets six more foundational contributions to medicine.

10 Ignaz Semmelweis – Handwashing and Antisepsis

Semmelweis showed that handwashing with chlorinated lime reduced puerperal fever. In POLIS V12, handwashing removes tensional contaminants (external pathogens) from the solid mesh (skin). Before washing, the external polis (dirty hands) had high K_{dirt}. After washing, $K_{\text{clean}} \approx 0$. The reduction in K lowers the total ϵ of the mother-infant system, preventing Phase 4 explosion.

Semmelweis's tragedy (his rejection by peers) reflects the resistance of established medical polises to re-normalising their own K parameters. His work is a tensional intervention: changing the boundary conditions of the clinical encounter.

11 Louis Pasteur – Germ Theory of Medicine

Pasteur extended his germ theory to infectious diseases. In POLIS V12, a pathogenic microbe is an external polis with its own K_{microbe}. It invades the host's solid mesh, raising local K until a Phase 4 threshold is crossed (symptoms). The host's immune system is the

liquid mesh that attempts to reduce K_{microbe} through phagocytosis (tensional absorption) or antibodies (neutralisation).

Pasteur's rabies vaccine (attenuated virus) is a microbe with K reduced just below the explosive threshold – a Phase 5 training tool. His swan-neck flask experiment (spontaneous generation disproved) shows that without external K input (airborne microbes), a sterile broth (a polis with all $K = 0$) remains at $\epsilon = 0$ indefinitely.

12 Robert Koch – Koch's Postulates

Koch formulated criteria to link a microbe to a disease. In POLIS V12, Koch's postulates are the conditions for establishing a causal tensional relation between an external polis and a host disease:

1. The microbe must be found in diseased hosts (high K_{microbe} correlates with high host symptom K). 2. It must be isolated and grown in pure culture (isolate the polis with its characteristic K). 3. Inoculation into a healthy host must reproduce the disease (transferring K_{microbe} into a low-K host causes Phase 4). 4. The microbe must be re-isolated (recover the same K after the cycle).

These postulates ensure that the tensional perturbation is specific and reproducible.

13 Alexander Fleming – Penicillin

Fleming discovered that a mould (Penicillium) produced a substance that killed bacteria. In POLIS V12, penicillin is a tensional disruptor: it binds to bacterial cell wall synthesis enzymes, increasing the bacterium's K to saturation (Phase 3) and then causing a local Phase 4 explosion (lysis). The antibiotic's effect is dose-dependent: at low concentration, it reduces $K_{\text{bacterium}}$ to sub-lethal levels; at high concentration, it drives K to 1.

The emergence of resistance (e.g., penicillinase) is an increase in the bacterium's ability to reduce the effective K of the antibiotic – a change in its own normalisation parameters.

14 Florence Nightingale – Statistics and Hospital Hygiene

Nightingale used statistical analysis to show that sanitation reduced mortality. In POLIS V12, her polar area diagrams are visualisations of IDT* over time. For a hospital, compute the mortality rate m as v. Normalise: $K_{\text{mort}} = (m - T)/(v_{\max} - T)$. The goal is to reduce K_{mort} towards 0. Nightingale's interventions (ventilation, clean water, handwashing) lower the external K load on patients.

Her "coxcombs" (histograms) show the effect size. She effectively introduced the STOP criterion to hospital management: when mortality stops decreasing (IDT* stable), further improvements require different measures.

15 Paul Ehrlich – Chemotherapy and the Magic Bullet

Ehrlich developed Salvarsan, a treatment for syphilis, seeking a "magic bullet" that selectively targets pathogens. In POLIS V12, a magic bullet is a molecule whose K_{drug} is tuned to resonate with the pathogen's K_{target} but not with host tissues. The drug's tensional residual x_{drug} couples strongly to the pathogen (high VT) and weakly to the host.

Ehrlich's side-chain theory of immunity proposed that cells have receptors (binding sites) that match specific toxins. In POLIS V12, receptors are solid mesh nodes with complementary K values. The lock-and-key model is a tensional matching condition: $K_{\text{receptor}} + K_{\text{ligand}} = 1$ for optimal binding.

16 Conclusion

Six additional medical pioneers are reinterpreted within the POLIS V12 tensional ontology. Handwashing, germ theory, postulates, antibiotics, hospital statistics, and chemotherapy all become natural consequences of the closure condition $\epsilon = \sum K_m(2 + K_m) = 0$ and the fractal hierarchy of medical polises. No free parameters are added; the same equations that describe a physical system or a philosophical argument also describe the practice of medicine.

Zenodo references (pending)

- Main treatise: [Zenodo DOI pending]
- POLIS Bible: [Zenodo DOI pending]

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