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## Challenges in the Pedagogy of Clinical Reasoning: a philosophical reframing

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### ABSTRACT

Clinical reasoning lies at the heart of medical practice, yet its teaching remains one of the most conceptually complex challenges in medical education. Contemporary approaches, largely informed by cognitive science, have illuminated the mental mechanisms underlying diagnosis but have simultaneously reduced reasoning to an individual, decontextualized act of information processing. This reduction has led to a subtle yet pervasive dehumanization of clinical reasoning, obscuring its social, embodied, and interpretive dimensions. This paper argues that a comprehensive understanding of clinical reasoning requires a philosophical reframing that integrates insights from the philosophy of science, medicine, and technology, i.e. TRI-P model. In this sense, Medicine is best understood as a scientific practice realized through the mediation of technology, yet always oriented toward its ultimate telos: the care and healing of the patient. Through this synthesis, the study shows that reasoning in medicine is not a neutral cognitive operation but an interpretive, dialogical, and technologically mediated form of human understanding. Accordingly, a rehumanized pedagogy—grounded in epistemic pluralism, dialogical humanism, and critical technological literacy—is essential for cultivating responsible clinical judgment. From this perspective, clinical reasoning cannot be captured by cognitive models alone but must be reframed as phronesis: a form of practical wisdom enacted in moral and interpretive contexts. Drawing on Gadamer's hermeneutic philosophy and Kenneth Sharpe's conception of phronetic practice, the paper situates clinical reasoning as an embodied, dialogical, and ethically responsive activity. It concludes that medical education should nurture reflective judgment and moral discernment rather than mere analytical accuracy.

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## **Intruduction**

Clinical reasoning is widely regarded as the cornerstone of medical practice. It enables physicians to move from patient's complaints to diagnostic and therapeutic decisions, yet failures in reasoning are among the leading contributors to medical error. Empirical studies suggest that many medical mistakes arise not from deficits in medical knowledge but from systematic reasoning failures such as premature closure, confirmation bias, or overreliance on pattern recognition detached from reflective analysis (Norman, 2005; Croskerry, 2009). Thus, improving clinical reasoning has both epistemic and moral significance: it is a matter of enhancing the accuracy of diagnosis and management and of protecting patients from avoidable harm.

However, most pedagogical approaches to clinical reasoning have been shaped within the framework of cognitive paradigm. They tend to treat reasoning as an information-processing task—something that occurs in the clinician's mind, analogous to a computational operation. In this framing, the physician becomes a processor of inputs, the patient a source of data, and knowledge a set of algorithms to be applied. While such models have produced valuable insights into heuristics, biases, and dual-process theories, they risk portraying medicine as a merely technical enterprise, detached from the interpretive, moral, and contextual dimensions of human care and consequently dehumanize medicine.

From a philosophical perspective, this reductionist framing overlooks the complex nature of reasoning in medicine. Clinical reasoning is not simply an exercise in logic; it is a situated, embodied, and dialogical act. It involves not only inference from data but also interpretation of meaning, negotiation of values, and moral responsibility. Each diagnostic or therapeutic decision reflects implicit judgments about what counts as relevant evidence, what outcomes are desirable, and how patient preferences and narratives should shape the process.

This paper proposes that the persistent difficulties in teaching clinical reasoning stem from a lack of philosophical reflection on its nature. Why is evidence alone insufficient for clinical decision-making? Can the patient's lived experience be meaningfully integrated into clinical reasoning? How can dialogue with the patient become the central axis of the reasoning process? Does technology necessarily fragment the physician-patient relationship, or can it play a constructive role in clinical judgment? These and many other questions reveal that a genuine understanding of clinical reasoning requires philosophical reflection on the very nature of medicine. In this view, medicine is an integration of science, practice, and technology—all oriented toward the ultimate goal of medicine: the care and cure of the patient. Together, these perspectives provide the conceptual tools to reframe the pedagogy of clinical reasoning — to move beyond narrow cognitive paradigms toward a more holistic and reflective model of teaching and practice.

In this paper, I will first examine the cognitive paradigm, outlining its main contributions to our understanding of clinical reasoning and its pedagogy. I will then argue that a comprehensive and precise understanding of clinical reasoning requires an inquiry into the nature of medicine itself, which inevitably leads us to philosophical analysis. The philosophical framework adopted in this study is based on the Tri-P model, developed from and extending Kazem Sadeghzadeh's idea of meta-medicine. Building upon this model, I will identify the limitations of the cognitive paradigm, and finally demonstrate that an adequate pedagogy of clinical reasoning must be grounded in the revival of the Aristotelian concept of *phronesis*.

## 1. Cognitive Paradigm and the Nature of Clinical Reasoning

Historically, early investigations into diagnostic thinking during the 1970s and 1980s were influenced by the rise of information-processing psychology. Elstein, Shulman, and Sprafka (1978) described the “hypothetico-deductive model” in which clinicians generate hypotheses early and then test them through data collection. This model emphasized logical coherence and analytical rigor, aligning medical thinking with problem-solving in the natural sciences. However, it soon became evident that real-world reasoning rarely follows such a linear sequence. Clinicians often rely on intuitive pattern recognition—a rapid, experience-based process that cannot be easily formalized.

The emergence of the cognitive paradigm in the late twentieth century fundamentally transformed our understanding of how clinicians think. The current formulation of clinical reasoning is built upon a cognitive science metaphor that conceives of the mind as a computer—an information-processing system in which data are input, processed through internal operations, and ultimately produce an output or decision. In this section, we briefly outline some of the most significant contributions of the cognitive paradigm to our understanding of clinical reasoning.

### 1-1. Clinical Reasoning and Scientific Reasoning: Divergent Logics

Cognitive research demonstrated that *clinical reasoning is not equivalent to scientific reasoning*—and that physicians do not think like laboratory scientists. Rather than following formal deductive or inductive logic, clinical reasoning unfolds in complex, context-sensitive ways that involve perception, intuition, and experience as much as analytical calculation (Elstein, Shulman, & Sprafka, 1978; Norman, 2005). The contribution of cognitive paradigm was to reveal that clinical reasoning is not a direct application of the scientific method. Scientific reasoning typically operates within controlled environments where variables can be isolated and hypotheses tested systematically. By contrast, clinical reasoning occurs under conditions of uncertainty, where data are incomplete, patients are unique, and time is limited. Physicians must often act before sufficient evidence is available, guided by experience, pattern recognition, and contextual understanding. Thus, while science seeks generalizable truth, clinical reasoning seeks practical adequacy—an understanding sufficient to act responsibly in

a particular case. This distinction underscores an important epistemological difference. Science privileges universal laws and statistical validity; medicine privileges singular judgment and moral responsibility. The cognitive paradigm thus reframed medical reasoning not as an application of universal rules but as a *situated cognitive performance* shaped by context, experience, and the clinician's evolving expertise (Schön, 2017,62-63).

### **1-2. Pattern Recognition and Non-Analytical Thought**

A second finding of cognitive research was the central role of *pattern recognition* in expert clinical reasoning. While novice clinicians tend to reason analytically—explicitly generating and testing hypotheses—experienced physicians often recognize diagnostic patterns almost instantaneously. This process, described as “*non-analytical reasoning*” or *intuition*, relies on the rapid matching of perceptual cues to stored mental representations of prior cases (Norman, 2005; Croskerry, 2009).

Far from being irrational, this intuitive reasoning reflects the accumulation of vast experiential knowledge. The physician's mind functions as a dynamic repository of illness scripts—structured clusters of information about diseases, symptoms, and contexts. When a new patient presents, the clinician subconsciously compares the current situation with previous patterns. Recognition occurs not through formal logic but through the immediate apprehension of a meaningful whole (Monajemi & Rikers, 2011; Monajemi & Rikers, 2012).

### **1-3. Dual-Process Theory: Moving Between Intuition and Analysis**

Subsequent cognitive research developed this understanding into *dual-process theory*, which proposes that reasoning operates through two interacting systems. System 1 is fast, intuitive, and pattern-based; System 2 is slow, analytical, and reflective (Evans, 2008). In clinical reasoning, physicians constantly move back and forth between these modes—recognizing familiar patterns, but also pausing to analyze when uncertainty or contradiction arises.

This dynamic oscillation is essential to safe and effective reasoning. Overreliance on intuition can lead to cognitive biases such as premature closure or confirmation bias, while excessive analysis can paralyze decision-making. Expert clinicians exhibit *metacognitive awareness*: the ability to monitor their own thought processes and to know when to trust intuition and when to slow down for reflection (Croskerry, 2003).

In this sense, expertise in reasoning is not simply a matter of accumulating knowledge but of mastering *cognitive flexibility*. The mature clinician moves fluidly between intuitive and analytical reasoning, integrating them into a coherent and adaptive practice.

### **1-4. The Refinement of Knowledge Through Experience**

Another crucial insight of the cognitive paradigm is that a clinician's medical knowledge is not static but evolves continuously through experience. Each patient encounter refines, corrects, and elaborates the physician's mental representations of disease. Illness scripts become increasingly nuanced as new variations and exceptions are encountered. Clinical understanding

advances not by discovering immutable laws but by revising working hypotheses in light of experience. Expertise thus emerges through the accumulation of a richly textured memory of cases—what Schön (1983) called reflection-in-action.

### **1-5. The Formation of Expertise: Practice over Propositions**

Cognitive research also illuminated how clinical expertise develops. It is not achieved by reading more textbooks or memorizing more facts, but by repeated engagement with real or simulated cases. Expertise emerges from situated learning, where the learner participates in authentic clinical contexts, gradually internalizing the perceptual and interpretive skills of experienced practitioners (Norman, 2005).

The key mechanism is *pattern enrichment*: with each encounter, the clinician's mental library of illness scripts becomes denser and more interconnected. This process cannot be replaced by theoretical instruction alone because much of it involves non-verbal, tacit learning—perceiving subtle cues, developing diagnostic intuition, and acquiring a sense of “clinical gaze.” From a pedagogical perspective, this finding challenges the notion that reasoning can be taught as an abstract cognitive skill. Instead, it must be cultivated through apprenticeship, mentorship, and reflection on lived experience—what the philosophy of education calls formation rather than instruction.

### **1-6. Cognitive Errors and the Limits of Expertise**

Finally, the cognitive paradigm revealed that medical error often arises not from lack of knowledge but from failures in reasoning. Diagnostic mistakes frequently result from cognitive biases or breakdowns in the coordination between intuitive and analytical processes. For example, a physician may fixate prematurely on a single diagnosis (anchoring bias) or seek confirming evidence while ignoring disconfirming data (confirmation bias) (Croskerry, 2009).

Recognizing this has important educational and ethical implications. It suggests that improving patient safety requires not only more knowledge but greater *awareness of one's own reasoning*. Metacognitive training—learning to identify and correct cognitive biases—becomes as essential as biomedical education. Yet even this awareness has limits: because reasoning occurs within complex, time-pressured environments, error can never be fully eliminated. Instead, clinicians must cultivate epistemic humility and reflective vigilance.

## **2. Educational Models based on the Cognitive Paradigm and its limitations**

The cognitive paradigm has profoundly shaped educational models for teaching clinical reasoning by framing it as an information-processing activity. Grounded in cognitive psychology, it provided the theoretical basis for structured pedagogies such as problem-based learning (PBL), illness script theory, and dual-process training (Norman, 2005; Schmidt & Rikers, 2007). PBL, rooted in the hypothetico-deductive model, encourages learners to generate and test hypotheses through authentic cases, fostering self-directed inquiry and reflection (Barrows, 1986). Within this framework, illness scripts—networks linking symptoms,

pathophysiology, and management—are gradually refined through repeated exposure to clinical cases (Monajemi & Rikers, 2012). Building on this, illness script-based instruction emphasizes that expertise depends on the richness and organization of scripts in memory.

The emergence of dual-process pedagogy further advanced this paradigm by distinguishing between intuitive (System 1) and analytical (System 2) reasoning, promoting metacognitive awareness through reflective strategies such as diagnostic time-outs and cognitive-forcing tools (Eva, 2005; Croskerry, 2009).

Despite decades of educational reform, the teaching of clinical reasoning continues to face significant conceptual and practical challenges. Much of the criticism targets the dominance of the cognitive psychology paradigm, which frames reasoning as a set of internal mental processes to be improved through the correction of biases or enhancement of analytical strategies (Norman, 2005; Croskerry, 2009). While this perspective has deepened our understanding of diagnostic error, it has also led to pedagogical methods that oversimplify the inherently social, interpretive, and contextual nature of reasoning.

One major critique is that traditional instructional models—such as problem-based learning (PBL), case-based discussions, and analytic reasoning tutorials—often fail to capture the complexity of authentic clinical reasoning in practice (Eva, 2005). These methods typically use paper cases or simulated scenarios stripped of the uncertainty, emotion, and interpersonal interaction characteristic of real patient encounters. As a result, learners practice decontextualized problem-solving rather than situated reasoning. Research indicates that reasoning performance in artificial settings poorly predicts performance in the clinic, where time constraints, communication, and ethical ambiguity play critical roles (Schmidt & Mamede, 2015).

A second limitation concerns the fragmentation of knowledge and skills in most curricula. Clinical reasoning is frequently taught as a discrete cognitive skill separate from communication, ethics, or patient management. This compartmentalization fails to reflect how reasoning actually unfolds in real practice—where diagnosis, decision-making, and moral deliberation are inseparable (Higgs & Jones, 2019, 19-29). Critics argue that such modular teaching reinforces the misconception that reasoning can be mastered through algorithmic steps rather than developed through integrative reflection and experience (Bordage, 2007).

Moreover, assessment practices in medical education have been criticized for privileging accuracy over reasoning quality. Standardized tests such as multiple-choice questions and key-feature problems emphasize correct answers rather than the thinking process behind them. This approach risks producing “test-smart” students who can reproduce textbook reasoning but lack adaptability in complex clinical environments (Eva & Regehr, 2007). Scholars have called for more formative and narrative forms of assessment that value metacognition, reflection, and epistemic humility (Durning et al., 2013).

Another important critique addresses the lack of attention to tacit and experiential knowledge. Professional reasoning involves “knowing-in-action,” an embodied and intuitive form of understanding that cannot be fully verbalized or codified. Yet current pedagogical frameworks often focus exclusively on explicit, declarative knowledge, neglecting the apprenticeship and reflective dimensions through which expertise is cultivated. This gap explains why even after years of training, many learners struggle to transfer classroom reasoning to the bedside (Norman et al., 2017).

Finally, critics highlight the insufficient incorporation of affective, ethical, and sociocultural factors in reasoning education. The traditional focus on cognitive accuracy marginalizes how emotions, moral judgment, and cultural context influence clinical decisions (Montgomery, 2006,84-92). Calls for a more humanistic and contextual pedagogy suggest that reasoning should be taught not as a purely technical skill but as a relational and interpretive practice shaped by dialogue, empathy, and professional virtue (Higgs et al., 2019, 19-29).

In summary, the critiques of clinical reasoning education converge on a shared theme: existing models, dominated by cognitive psychology, fail to represent the lived reality of medical reasoning. Future approaches must integrate cognitive, ethical, and humanistic dimensions, emphasizing reflection, dialogue, and contextual understanding as the core of pedagogical reform.

### 3. The importance of philosophical reflection of clinical reasoning

A comprehensive and precise formulation of clinical reasoning requires a philosophical reflection on the very nature of medicine. In this view, medicine is an integration of science, practice, and technology—all oriented toward the ultimate goal of medicine: the care and cure of the patient.

Kazem Sadeghzadeh’s Analytic Philosophy of Medicine presents a bold and comprehensive vision of the nature of medicine which has been selected as the theoretical framework in this paper. He rejects simplistic dichotomies (e.g. “science vs. art”) and instead insists on a *multi-dimensional account* in which medicine is simultaneously scientific, practical, normative, and technological. According to Sadeghzadeh, a truly adequate philosophy of medicine must attend not only to biological facts or etiologies, but to language, decision, obligation, and the fuzzy boundaries that medical practice inevitably navigates (Sadeghzadeh, 2015, 829-852).

Central to his approach is the claim that *clinical practice is “practiced morality.”* That is, medicine is not a value-neutral technical enterprise; every diagnostic, therapeutic, and prognostic act carries a deontic force—obligations, risks, and judgments about what one ought to do (Sadeghzadeh, 2015, 829-852). Hence, he regards medicine as a *deontic discipline*, where medical concepts (e.g. “disease,” “diagnosis,” “therapy”) are not purely descriptive but carry normative commitments. This is why Sadeghzadeh devotes considerable attention to *medical deontics* (the logic of obligation) alongside medical logic and ontology.

Another pillar of his theory is logical pluralism and fuzzification. Recognizing the inherent vagueness and indeterminacy in medical concepts, Sadeghzadeh rejects a single logic of medicine. Instead, he introduces multiple logical systems—classical, non-classical, fuzzy, probabilistic, temporal, deontic logic—to model medical reasoning more faithfully (Sadeghzadeh, 2015, 829-852). By applying fuzzy logic to medical ontology, decision-making, and deontics, he aims to better capture the gradations, prototypes, and boundary cases that characterize real clinical practice. For him, the mental model of medicine must accommodate degrees of membership (in disease categories), prototype resemblance, and context sensitivity.

Sadeghzadeh also stresses that language matters deeply in medicine. Medical language is not a clean, unambiguous system but a hybrid extension of ordinary language, burdened by imprecision and conceptual tension. He analyzes the syntax, semantics, and pragmatics of medical discourse, arguing that much of medical uncertainty arises from language being “ill-structured” and underdetermined (Sadeghzadeh, 2015, 829-852). In this view, the way clinicians talk, define, and frame symptoms and diagnoses are itself part of what medicine is.

Finally, Sadeghzadeh rejects the view of medicine as a monolithic science or art; Thus, biomedicine is natural science, clinical research is normative inquiry, and clinical practice is moral action, all entwined in a layered ontology of medicine (Sadeghzadeh, 2015, 829-852). In this sense, medicine is a scientific practice that, through the mediation of technology, realizes its ultimate goal: the care and cure of the patient. In this conception, medicine is neither pure science nor mere technology, nor does it fit within the conventional dichotomy of science and art. Rather, understanding the true nature of medicine requires grasping it as a teleological practice—a form of action oriented toward an end.

In short, Sadeghzadeh offers a *unified and rigorous account* of medicine’s nature: it is not simply knowledge but *action with meaning*, not only diagnostic reasoning but moral deliberation, not only objective facts but interpretive language, and not only human agency but technological mediation.

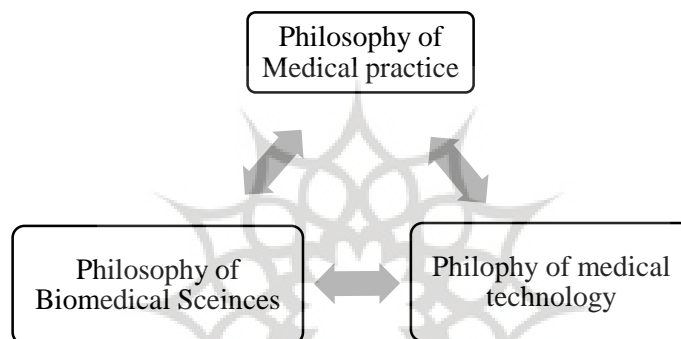
Sadeghzadeh’s Analytical Philosophy of Medicine provides an essential foundation for the Tri-P model by conceptualizing medical concepts as inherently fuzzy, value-laden, and deontic rather than descriptive. His idea of meta-medicine<sup>1</sup> aims to reveal the logical and semantic structures that underlie medical reasoning, showing that diagnosis and treatment are not neutral acts of classification but normative judgments directed toward patient care. Building upon this insight, the Tri-P model operationalizes Sadeghzadeh’s framework by integrating the philosophy of science, medicine, and technology into a unified interpretive schema. It transforms meta-medicine from an analytical project into a practical epistemology for teaching

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<sup>1</sup> The idea of Sadeghzadeh’s meta-medicine was originally presented only in a very concise and editorial form; in this paper, that preliminary idea has been systematically expanded and developed into a comprehensive philosophical framework.

and understanding clinical reasoning—one that acknowledges ambiguity, moral deliberation, and the mediated nature of knowledge in medicine.

The TRI-P Model which has been employed in this paper to analyze clinical reasoning is fundamentally grounded in the philosophical analyses of the nature of medicine developed by Kazem Sadeghzadeh. It may be seen as an extension and refinement of Sadeghzadeh's concept of Meta-Medicine, expanding his insight into a comprehensive framework that integrates the philosophy of science<sup>1</sup>, philosophy of medicine, and philosophy of technology. (Monajemi, 2021(a); Monajemi, 2021 (b)) In this sense, the TRI-P Model builds upon his foundational idea that medicine cannot be understood within the confines of a single epistemic domain but must be approached as a meta-level inquiry into the interplay between scientific knowledge, technological mediation, and the lived experience of illness.



**Figure 1.** Tri-P model: An Integrative Framework Linking the Philosophies of Science, Medicine, and Technology

<sup>1</sup> Within the Tri-P model, the philosophy of science provides the epistemological grounding for understanding medicine as a non-positivist scientific practice. Rather than viewing medicine through the lens of logical positivism—which seeks objectivity through detached observation and verification—the Tri-P framework aligns with post-positivist and critical-realist philosophies that emphasize interpretation, contextuality, and the fallibility of scientific knowledge. Thinkers such as Kuhn (1962), Laudan (1984), and Cartwright (1999) have shown that science is a dynamic, historically embedded activity, shaped by paradigms, models, and human judgment rather than immutable laws. From this non-positivist standpoint, medical reasoning is best understood as an abductive and interpretive enterprise—one that bridges empirical evidence with moral and contextual understanding in the care of individual patients. Thus, within the Tri-P framework, medicine is not a mechanical application of evidence but a form of practical inquiry where knowledge, technology, and ethical purpose converge to realize the telos of care. For further reading, see:

Cartwright, N. (1999). *The Dappled World: A Study of the Boundaries of Science*. Cambridge University Press.

Kuhn, T. S. (1962). *The Structure of Scientific Revolutions*. University of Chicago Press.

Laudan, L. (1984). *Science and Values: The Aims of Science and Their Role in Scientific Debate*. University of California Press.

#### **4. Critique of Clinical Reasoning formulated by cognitive paradigm**

The cognitive-scientific formulation of clinical reasoning portrays it as a process that occurs exclusively within the physician's mind, while the patient functions merely as a source of information. This mentalistic framing strips the clinical encounter of its relational and interpretive depth, resulting in a subtle yet pervasive dehumanization of both physician and patient. The physician is reduced to a data processor, and the patient to an object of analysis. In the following, the main criticisms that can be raised based on the TRI-P model are discussed:

##### **4-1. Evidence, Judgment, and the Misinterpretation of Reasoning**

One of the major problems in the current pedagogy of clinical reasoning is the mistaken assumption that evidence-based medicine (EBM)<sup>1</sup> is equivalent to clinical reasoning itself. In fact, EBM is primarily concerned with the classification and appraisal of research evidence—data derived from population-level studies—whereas clinical reasoning concerns decision-making for a single, unique patient in a specific context (Tanenbaum, 1993; Montgomery, 2006,84-92). The former deals with generalizable probabilities; the latter requires interpretive judgment in the face of individual variability and situational complexity (Greenhalgh, Howick, & Maskrey, 2014). Confusing the two not only oversimplifies the reasoning process but also risks reducing medical care to statistical application rather than practical wisdom (Stempsey, 2013).

##### **4-2. The Role of Language and the Dialogical Foundations of Understanding**

Clinical reasoning, in this prevailing view, unfolds through the specialized terminology of biomedicine, a language that defines and constrains what can be thought and spoke. Yet this narrow linguistic domain obscures two fundamental facts: first, that reasoning in medicine begins not with scientific vocabulary but with the patient's everyday language of suffering; and second, that medical terminology itself is historically an extension and transformation of ordinary speech. The cognitive model's neglect of natural language thus silences the dialogical roots of understanding. The Tri-P reconstruction reinstates the continuum between ordinary and technical language, acknowledging that genuine understanding in medicine depends upon the capacity to translate between them.

For such translation to occur, dialogue is indispensable. The physician must interpret the patient's complaints—articulated in the language of lived experience—into the specialized categories of medical knowledge. This hermeneutic process of mutual interpretation, however, is almost entirely absent from cognitive-scientific formulations, which imagine understanding as internal computation. In practice, meaning emerges only through communicative engagement. The Tri-P model therefore redefines reasoning as a fundamentally dialogical act, grounded in conversation and interpretive responsiveness. This is precisely what contemporary

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<sup>1</sup> Evidence-Based Medicine (EBM) is the conscientious, explicit, and judicious use of the best current evidence in making decisions about the care of individual patients (Sackett et al., 1996).

symptom checkers and algorithmic systems fail to achieve: they manipulate data but cannot participate in dialogue, and therefore cannot understand.

#### **4-3. Participation, Collaboration, and Shared Deliberation**

Cognitive psychology also tends to represent clinical reasoning as a linear, top-down process in which the physician's mental operations transform patient data into diagnostic output. Within this framework, the clinician is positioned as the sole decision-maker, while the patient's role is passive and subordinate. Such an authoritarian model distorts the collaborative nature of medical practice, where understanding and judgment emerge through interaction. A reconstructed model must instead incorporate the participatory agency of the patient, treating them as a co-author of meaning and a partner in deliberation. By embedding the patient's narrative and perspective into the reasoning process, medicine reclaims its ethical and humanistic core, transforming reasoning from an act of command into an act of shared understanding.

Equally problematic is the assumption that medicine functions as a natural science and that diagnosis constitutes the final goal of reasoning. When diagnosis is treated as the ultimate epistemic act, medical thought collapses into classification rather than care. The true telos of medicine, however, lies not in diagnosis but in clinical deliberation—the prudent, context-sensitive management of illness in a living person. Diagnosis is a means, not an end. The Tri-P model thus reorients reasoning toward praxis: the art of discerning what should be done here and now, for this particular patient, in light of both evidence and values.

The cognitive framework further marginalizes the patient's *illness experience*. The lived, subjective dimension of being unwell—how illness feels, disrupts, and transforms one's world—rarely enters the clinician's reasoning. Attention is directed instead to measurable signs and test results, as if the person's story were a distraction from the “real” data. The consequence is a subtle but profound alienation: the patient feels unseen, their suffering rendered epistemically irrelevant. A rearticulated model must restore this experiential knowledge as an essential component of reasoning itself. The patient's narrative is not context but content; it discloses phenomena invisible to measurement. When physicians allow the patient's own understanding of illness to shape the diagnostic and therapeutic process, reasoning becomes more humane, responsive, and complete.

Patients rarely approach the clinic as blank slates. They arrive with pre-existing interpretations, partial self-diagnoses, and culturally informed narratives of what their symptoms mean. Yet physicians often dismiss these understandings as naïve or irrelevant, focusing instead on extracting objective data. This disregard undermines trust and weakens adherence to care. From an anthropological and hermeneutic perspective, such pre-understanding is not noise but knowledge—it is the patient's own effort to make sense of suffering. A genuinely interpretive model of reasoning must therefore engage with this narrative

background, not to validate it uncritically but to incorporate it as part of the dialogical process. Through this conversation of understandings, the clinician and patient together construct a shared account of illness and recovery.

#### **4-4. Context, Culture, and Situated Understanding**

Another limitation of the cognitive model lies in its assumption of universality. Clinical reasoning is often treated as a fixed algorithm capable of producing the same diagnosis wherever similar symptoms appear. Such a universalist conception ignores the profound influence of cultural, social, and linguistic contexts on how illness is experienced and expressed. Symptoms do not speak the same language in every world; they are culturally mediated signs. The Tri-P model therefore rejects universalism in favor of situated reasoning: an approach that acknowledges the contextual embeddedness of all medical understanding. To reason clinically is to interpret within a lifeworld, not to apply a context-free algorithm.

#### **4-5. Embodiment, Technology, and the Limits of Artificial Intelligence**

Cognitive formulations also render reasoning disembodied, treating it as pure cognition detached from the bodily, sensory, and affective dimensions of clinical practice. This abstraction fuels the illusion that artificial intelligence can replicate medical reasoning—that diagnosis and treatment are merely computational problems. From a phenomenological standpoint, however, reasoning is embodied cognition: it arises through the clinician's tactile engagement, perceptual attunement, and emotional resonance with the patient. Machines lack this embodied presence; they process representations, not realities. Rehumanizing reasoning therefore requires restoring embodiment as the foundation of perception and empathy. Only an embodied clinician can truly understand a suffering body.

#### **4-6. Tacit Knowledge, Education, and the Myth of Mechanization**

The tendency to construe reasoning as propositional knowledge—a set of explicit rules—has likewise distorted medical education. It has created the illusion that reasoning can be taught through lectures or formal algorithms, ignoring its tacit and experiential nature. Clinical reasoning resembles knowing how rather than knowing that: it is acquired through practice, reflection, and embodied participation, much like learning to swim or to play an instrument. As Polanyi observed, “we know more than we can tell.” Algorithms can simulate logical order but cannot embody moral sensitivity or perceptual intuition. The Tri-P model therefore redefines reasoning as a practical art—a form of phronetic wisdom cultivated through apprenticeship and reflective practice rather than theoretical instruction.

Finally, the repeated failure to mechanize clinical reasoning reveals the deeper confusion at the heart of the cognitive paradigm: the inability to distinguish between what can be verbalized and what remains non-verbalizable in human understanding. Machines can operate only within the explicit domain of symbols and data, while much of clinical knowledge resides in tacit, embodied awareness. By conflating these realms, technologists have overestimated the capacity

of computation to replicate judgment. What is non-verbalizable—the moral intuition guiding care, the empathic perception of distress, the sense of “something not quite right”—cannot be captured by algorithms. The Tri-P reconstruction thus advocates a critical realism toward technology: embracing its analytic power while safeguarding the irreducibly human dimensions of reasoning.

In each domain where cognitive models reduce reasoning to individual cognition, the Tri-P framework restores contextuality, dialogue, and ethical purpose. By grounding reasoning in interpretive practice rather than internal computation, Tri-P reframes the physician’s task from data analysis to meaning-making through participation and care. Each limitation of the cognitive paradigm—be it dehumanization, linguistic reductionism, or overreliance on technology—is reinterpreted as a site of philosophical reconstruction. In this sense, Tri-P is not a rejection of cognitive insights but their transformation into a richer, embodied, and dialogical understanding of medical reasoning.

## **5. Reconstructing Clinical Reasoning: The Tri-P Model**

Taken together, these critiques point to the need for a comprehensive reconstruction of clinical reasoning. The Tri-P model—grounded in the intertwined philosophies of science, medicine, and technology—proposes a humanistic, dialogical, and context-sensitive framework. In this reimagined formulation, reasoning is no longer the private computation of a detached mind but a collaborative act of understanding that unites evidence, interpretation, embodiment, and care. By integrating these dimensions, the Tri-P model restores medicine to its proper vocation: a practice of healing that joins

clinical reasoning arises in dialogue—with patients, with colleagues, and with one’s own moral conscience. It involves imagination, empathy, and interpretive sensitivity as much as logic and data. He concludes by calling for a renewed philosophy of medicine—one that reunites epistemology, ethics, and phenomenology to sustain medicine as a moral and humanistic practice rather than a purely technical science.

### **5-1. Tolerating uncertainties**

One of the most important aspects of teaching clinical reasoning is helping physicians recognize that uncertainty is an inherent and unavoidable part of medical judgment. The cultivation of tolerance for uncertainty is therefore essential to clinical expertise. Physicians who seek absolute certainty or unassailable conclusions will find clinical reasoning profoundly frustrating and ill-suited to the real conditions of medical practice. As [Fox \(1957\)](#) observed in her classic ethnographic study, uncertainty is intrinsic to medical knowledge itself, arising from the limitations of science, the variability of patients, and the ambiguity of clinical evidence. Later research in medical education has emphasized that effective clinicians are not those who eliminate uncertainty but those who can reason, decide, and act responsibly within it ([Ghosh, 2004](#); [Tonelli, 2006](#); [Beresford, 1991](#)). Teaching clinical reasoning, therefore, must include

fostering epistemic humility and the capacity to deliberate prudently amid indeterminacy—a skill more aligned with phronesis than with algorithmic certainty.

## **5-2. From Cognition to Co-Reasoning**

At the heart of the Tri-P reconstruction lies a decisive shift from individual cognition to co-reasoning. Clinical reasoning is not the private property of the clinician's mind; it unfolds in the dialogical and relational space among physicians, patients, and other members of the healthcare team, where meaning is co-constructed (Bleakley, Bligh, & Browne, 2011,87-89). The patient's story, gestures, and emotions are not data to be extracted but expressions to be interpreted. Likewise, nurses, therapists, and other professionals contribute distinct forms of practical and contextual knowledge that enrich the reasoning process.

This shift transforms reasoning from a solitary cognitive act into a moral and communicative event. The clinical encounter—and indeed the whole care process—becomes a site of shared understanding in which all participants contribute to articulating what is happening and what ought to be done. The physician's clinical judgment thus emerges not from detached calculation but from participation in a web of relationships founded on trust, empathy, and mutual recognition. The Tri-P model therefore replaces epistemic isolation with epistemic communion: knowledge is created in dialogue, through attunement to others' experiences, both lay and professional.

This participatory turn resonates with movements in interprofessional education (IPE) and collaborative practice, which emphasize that sound clinical reasoning is distributed across a team rather than confined to an individual mind (D'Amour & Oandasan, 2005). Interprofessional reasoning allows different epistemic standpoints—scientific, experiential, ethical—to intersect in the shared deliberation about patient care. Such reasoning is not reducible to consensus or protocol; it is an ongoing interpretive negotiation in which the physician's expertise, the nurse's proximity to patient experience, and the therapist's embodied understanding of recovery all coalesce into a more holistic judgment. In this sense, the Tri-P model envisions medicine as a community of interpreters—a practice in which cognition becomes collaboration and understanding arises through collective phronesis.

While co-reasoning with patients emphasizes dialogical understanding between physician and patient, interprofessional co-reasoning extends this relational model to the collaborative work of healthcare teams. Clinical judgment is increasingly distributed across networks of expertise—nurses, pharmacists, therapists, and specialists—each contributing unique interpretive perspective. The Tri-P model accommodates this plurality by framing reasoning as collective phronesis: the shared deliberation of diverse practitioners oriented toward the singular good of the patient. Such collaboration not only enriches epistemic diversity but also aligns with the ethical telos of care, transforming reasoning from an individual act of intellect into a communal act of responsibility (Bleakley, Bligh, & Browne, 2011,87-89)

### **5-3. Reintegrating ordinary language**

As [Sadeghzadeh \(2015\)](#) has shown, medical concepts are inherently vague and continuous with ordinary language. Their boundaries are fluid, not fixed, and their meanings depend on interpretation within context. This semantic indeterminacy makes dialogue between physician and patient central to the process of clinical reasoning. In every encounter, the physician must translate the patient's everyday expressions of suffering into the specialized terminology of medicine—a task that requires attentive listening and interpretive engagement ([Montgomery, 2006,84-92](#)). Misunderstandings often arise when patients, seeking recognition or legitimacy, adopt medicalized language to describe their complaints. For instance, a patient may say “I have migraines” instead of simply reporting “I have headaches,” presuming that the medical term will command greater attention. If the physician accepts such statements uncritically, without probing or dialogue, serious interpretive errors may follow.

This tendency toward premature medicalization is itself symptomatic of a breakdown in communicative trust. Many patients resort to biomedical terminology because physicians fail to engage with the ordinary language of lived experience, thereby discouraging genuine dialogue. Conversely, when physicians explain diagnoses or treatments exclusively in technical language, they alienate patients from understanding their own condition. This asymmetry of language not only fosters confusion but also undermines the patient's agency in care. Rehumanizing clinical reasoning therefore requires bridging the gap between medical and everyday language—recognizing that both are indispensable dimensions of understanding illness ([Gadamer, 1996,125-135](#); [Sadeghzadeh, 2015,59-82](#)). From a hermeneutic standpoint, clinical understanding arises within language as a medium of shared meaning. As [Gadamer \(1996, 127-130\)](#) argues, understanding is not a private act of cognition but a dialogical process that occurs “in the play of question and answer.” The physician's capacity to translate the patient's everyday expressions of suffering into clinical meaning depends on genuine conversation—a fusion of horizons between lifeworld and medical world. The Tri-P model situates this hermeneutic exchange at the very core of reasoning, portraying the clinical encounter as a process of co-interpretation rather than data transmission.

### **5-4. Dialogical and Participatory Reasoning**

The Tri-P framework also rejects the authoritarian structure implicit in the top-down model of reasoning. In place of a unilateral decision process in which the physician commands and the patient comply, it envisions a participatory epistemology of care. The patient's experiential knowledge is not subordinate to the clinician's scientific expertise but complementary to it. Decision-making becomes a collaborative deliberation rather than a transmission of orders.

Such participatory reasoning reflects the moral core of medicine: to act with and for the patient rather than upon them. The physician's authority is reinterpreted not as domination but

as responsible responsiveness. In this sense, the Tri-P model bridges the epistemic and ethical dimensions of medicine—showing that to know well is inseparable from caring well.

### **5-5. Reintroducing the Lived Experience of Illness**

One of the most radical contributions of the Tri-P model is its insistence that the lived experience of illness is epistemically significant. The patient's narrative, emotions, and bodily sensations are not mere background noise but integral components of reasoning. To understand a disease without understanding what it means to the person who suffers it is to know only half the truth.

Incorporating lived experience transforms the logic of reasoning itself. The patient's account can reveal aspects of the illness invisible to diagnostic tests—such as fatigue, fear, or the disruption of identity. These subjective dimensions are not secondary; they shape the trajectory of care. By acknowledging the epistemic value of experience, the Tri-P model restores the unity between scientific inquiry and human understanding.

If lived patient experiences are to be integrated into clinical reasoning, two conditions must first be met. First, these lived experiences must be systematically incorporated into the body of clinical knowledge—a process that has yet to take organized form. Current medical knowledge is largely constructed from patient histories and the objective findings obtained through physical examination and paraclinical investigations. It is time that patients lived experiences, too, become part of this knowledge base. Second, if clinical reasoning is to be grounded in dialogue and mutual understanding, empathy must be recognized as an inseparable component of the reasoning process. Empathy, however, cannot emerge in the clinical encounter unless the lived experience of the patient is acknowledged as epistemically significant. Recognizing and understanding the patient's subjective world are essential to transforming clinical reasoning from an exercise in problem-solving into an act of shared human understanding (Montgomery, 2006, 248 ).

### **5-6. From Diagnosis of disease to Patient Management**

If the nature and telos of medicine are properly understood, the praxeology of medicine and the aim of clinical reasoning will necessarily change. Within the cognitive paradigm, diagnosis is considered the major product of clinical reasoning. Yet, if the true goal of medicine is the care and cure of the patient, diagnosis must be regarded as a *means* rather than an *end*. As Sadeghzadeh (2012) has shown, medical concepts are not merely *descriptive* but *deontic*—they carry normative implications that orient medical reasoning toward action and intervention. Diagnosis, therefore, is not the final epistemic achievement but a step that guides the physician toward prudent clinical management.

Moreover, when clinical reasoning is understood as a participatory process between physician and patient, the patient's concern is rarely about the name of the disease but rather about whether they will recover—an orientation that shifts attention from diagnosis to

prognosis. In this reconstructed view, clinical reasoning becomes an interpretive and teleological activity, a form of practical wisdom that seeks not merely to classify illness but to restore health and well-being through thoughtful and context-sensitive care.

### **5-7. Technology and clinical reasoning**

When discussing the relationship between technology and clinical reasoning, we are dealing with a multifaceted issue. Technology has introduced a certain distance between physician and patient, reducing the opportunity for genuine dialogue in clinical encounters (Svrenaesus, 2000, 10-13). Physicians often see little need to converse deeply with patients when advanced technologies can quickly yield precise and objective data. However, within the framework proposed in this paper, such distancing is not inevitable—provided that the nature of medicine is rightly understood. Medicine and technology are now so deeply interwoven that one cannot practice medicine without technological mediation.

Technology plays a crucial role in two phases of clinical reasoning: data collection and data interpretation. In the collection phase, the way information is conceptualized matters profoundly, for the so-called “objective data” produced by medical instruments—from sphygmomanometers to MRI scanners—always require interpretation. Likewise, the use of emerging technologies such as artificial intelligence can assist physicians in diagnosis and treatment but can never replace them. As argued elsewhere:

The idea of AI completely replacing physicians is a pseudo-problem because medical practice is not merely a computational activity but an interpretive, moral, and technologically mediated form of human understanding. AI can simulate aspects of reasoning but cannot participate in dialogue, empathy, or moral discernment—the core dimensions of medical judgment (Monajemi, 2025).

In this light, technology should not be viewed as an obstacle to reasoning but as a partner whose proper integration depends on the physician’s reflective and interpretive engagement with both data and patient. The challenge is therefore not to choose between human and machine reasoning but to cultivate phronetic literacy—the wisdom to understand how technology both reveals and conceals aspects of the clinical world.

### **5-8. The hermeneutic relation with the world through technology**

Don Ihde distinguishes three possible relations among human beings, the world, and technology. One of these is the hermeneutic relation, in which the world and technology become intertwined, and our access to the world is mediated by technological instruments. In this relation, technology does not simply display the world but interprets it for us; what we perceive is the world-as-revealed-through-technology. Our engagement with reality is therefore interpretive, filtered through technological mediation (Ihde, 1990, 80–82).

This hermeneutic relation is particularly crucial in medicine, where much of the clinician’s knowledge of the patient is obtained through technological means. Biochemical assays, imaging

techniques, and a wide array of diagnostic and therapeutic devices have become so deeply integrated into medical practice that medicine without technological mediation is now inconceivable. Yet it is a mistake to assume that technology provides physicians with direct, unmediated access to objective data about the patient. As Ihde (1990, 81–82) emphasizes, technological mediation always involves interpretation: what is revealed through a medical image or laboratory value becomes meaningful only through the interpretive activity of the physician. Without such interpretation, the data produced by technology remain inert and clinically unintelligible. In this sense, clinical reasoning is always already a hermeneutic act—an interpretation of the technologically mediated world of the patient.

Therefore, critical technological literacy becomes an essential part of reasoning. Clinicians must learn to interpret technological outputs as texts that require understanding, not as infallible judgments. The goal is neither to resist technology nor to surrender to it but to establish a reflective partnership with it. When technology is integrated hermeneutically, it can expand rather than diminish the human dimensions of reasoning.

Following Ihde's notion of hermeneutic mediation, Verbeek and Feenberg further argue that technologies not only extend human capacities but also shape our moral and epistemic relations to the world. In clinical reasoning, this implies that technological artifacts—diagnostic devices, imaging systems, and AI tools—co-constitute how illness is perceived, interpreted, and acted upon. The ethical task, therefore, is not to eliminate technology but to engage it reflectively, cultivating a form of critical technological literacy that recognizes both its enabling and constraining powers. The Tri-P model situates technology within a relational and moral framework, where machines assist but do not replace the embodied, interpretive, and compassionate judgment of the clinician.

## **6. Clinical Reasoning as Phronesis: A Hermeneutic Reorientation of Medical Pedagogy**

In the reconstructed framework, clinical reasoning emerges as a deeply human practice—dialogical, embodied, and technologically aware. It resists reduction to algorithms while embracing the possibilities of thoughtful collaboration between human insight and digital precision. The Tri-P model offers a path beyond the sterile dualisms of mind versus body, science versus care, or human versus machine.

By grounding reasoning in the interconnected philosophies of science, medicine, and technology, this model provides a foundation for a truly *rehumanized medicine*: one that honors both the rigor of knowledge and the fragility of the human condition. Clinical reasoning, thus reimagined, becomes not the computation of data but the interpretation of life itself—a continuous act of understanding in the service of healing.

Phronesis can serve here as an umbrella concept as phronesis—practical wisdom that integrates scientific, humanistic and technological aspects of medical practice. The rehumanization of clinical reasoning requires a conceptual shift away from the cognitive-

scientific paradigm, which views reasoning as a dehumanized, algorithmic, decontextualized, and purely mental process. As discussed earlier, this paradigm reduces medical thinking to a form of information processing, neglecting its dialogical, embodied, and moral dimensions. To move beyond this reductionism, clinical reasoning must be understood not as a technical, i.e. *techne* or theoretical activity, i.e. *episteme*, but as a form of *practical wisdom*—what Aristotle called *phronesis*. *Phronesis* denotes a mode of reasoning grounded in lived experience, moral sensitivity, and contextual judgment; it is the capacity to deliberate well about what ought to be done in particular circumstances. In this sense, *phronesis* integrates cognition, emotion, and ethics into a unified act of discernment. Clinical reasoning, when rightly understood, embodies precisely this structure: it involves the prudent application of knowledge and technology to unique, uncertain, and value-laden situations.

In contrast to the cognitive-scientific model, which seeks generalizable rules and error correction, a *phronetic* model of reasoning embraces uncertainty as intrinsic to medicine. It acknowledges that no algorithm can determine the good for a particular patient, because what counts as “good” depends on the person’s values, life story, and existential situation. Thus, the education of clinicians should aim not merely to train problem-solvers but to cultivate wise practitioners capable of judgment and moral imagination. Teaching clinical reasoning as *phronesis* means fostering reflection, empathy, and dialogical understanding—capacities that can only be developed through practice, narrative engagement, and mentorship, not through abstract instruction. *Phronesis*, in this sense, teaches physicians and all healthcare professionals that knowledge, technology, and institutions are not ends in themselves but means oriented toward the true telos of medicine: the care of the patient. It reminds us that scientific expertise and technological mastery find their moral justification only when they serve healing as a human and ethical endeavor. In a genuinely *phronetic* medical culture, every dimension of practice—from diagnostic reasoning to institutional design—is evaluated by a single question: does it advance the patient’s care?

### **6-1. Gadamer and the Hermeneutics of Practical Understanding**

Hans-Georg Gadamer’s philosophy provides a profound foundation for reinterpreting clinical reasoning as *phronesis*. In *The Enigma of Health*, Gadamer (1996) argues that medicine is fundamentally a practical and dialogical art, not a natural science in the modern sense. Healing, he writes, cannot be achieved through technical control or theoretical explanation alone; it requires understanding the patient as a person situated within a lifeworld of meanings. Gadamer extends Aristotle’s notion of *phronesis* to medicine, suggesting that the physician’s task is not merely to apply general rules but to discern what is appropriate (to *prepon*) in each unique case through dialogue and interpretation (Gadamer, 1996, 38–44).

For Gadamer, *phronesis* is a form of hermeneutic understanding: a process of interpretation grounded in openness to the other and sensitivity to context. The physician, like the interpreter

must enter a “fusion of horizons” (Horizontverschmelzung) with the patient—bringing together medical knowledge and the patient’s lived experience of illness to co-construct understanding. This dialogical act transforms the clinical encounter from a unidirectional transfer of information into a shared exploration of meaning. In this sense, clinical reasoning becomes a moral and interpretive event, not a computational procedure. The physician’s judgment is thus not derived from universal rules but from an attuned responsiveness to the concrete situation.

## **6-2. Kenneth Sharpe and the Recovery of Practical Wisdom in Professional Life**

While Gadamer restores the philosophical roots of phronesis, Kenneth Sharpe and Barry Schwartz bring it into the realm of contemporary professional practice. In their book *Practical Wisdom: The Right Way to Do the Right Thing*, [Sharpe and Schwartz \(2010\)](#) argue that modern institutions—medicine among them—have been overtaken by what they call the “tyranny of rules and incentives.” Professionals are increasingly constrained by protocols, algorithms, and performance metrics that aim to ensure consistency but often erode moral agency and contextual judgment. The result is what they term a “moral deskilling” of practitioners: a loss of the capacity to exercise wisdom in the face of ambiguity. This critique resonates directly with the limitations of the cognitive paradigm in medical education, which prioritizes procedural correctness over moral discernment and contextual understanding.

For Sharpe, phronesis is the antidote to this moral and pedagogical crisis. It is the capacity to perceive the morally salient features of a situation, deliberate about the right course of action, and act with both compassion and competence ([Sharpe & Schwartz, 2010, 25–27](#)). In medicine, this means recognizing that every clinical decision involves balancing competing goods—beneficence and autonomy, efficacy and empathy, evidence and individual preference. Such balance cannot be achieved by rule-following or algorithmic reasoning alone; it requires practical judgment cultivated through experience, mentoring, and moral reflection. Sharpe emphasizes that phronesis is not innate but teachable—though not in the didactic sense. It is learned through apprenticeship to exemplars, reflective dialogue, and participation in communities of practice that value wisdom over mere efficiency.

However, Sharpe also insists that individual phronesis cannot flourish in isolation from its institutional environment. Practical wisdom depends not only on virtuous practitioners but on *phronetic organizations*—institutions whose norms, incentives, and goals support the exercise of judgment for the sake of care rather than compliance. When organizations prioritize metrics, billing targets, or procedural throughput over human care, they create structural conditions that suppress moral discernment. Physicians in such systems may know what the right thing to do is but find themselves unable to do it. In contrast, a phronetic institution is one that recognizes care as its ultimate telos and aligns its culture, evaluation, and governance with that goal ([Sharpe & Schwartz, 2010, 233–237](#)).

In medicine, this means that hospitals, medical schools, and health systems must embody the virtues they seek to cultivate in clinicians. Educational institutions should reward reflection, empathy, and teamwork rather than mere efficiency and test performance. Health systems should allow time for dialogue, continuity of care, and moral deliberation rather than enforcing productivity metrics that fragment relationships. Sharpe's insight transforms the pedagogy of clinical reasoning from an individual cognitive skill to a collective moral practice—one that requires institutional as well as personal commitment. The clinician's phronesis thus depends on the moral ecology of medicine: the organization must also be wise for the practitioner to act wisely. In this sense, Sharpe's account complements Gadamer's hermeneutic vision: while Gadamer teaches us that understanding is dialogical, Sharpe reminds us that dialogue itself must be institutionally sustained. Only in such a phronetic culture can clinical reasoning realize its true telos—care grounded in wisdom, compassion, and responsibility.

### **Conclusion**

The project of rethinking clinical reasoning requires more than a pedagogical adjustment—it demands a philosophical reframing. The preceding analysis has shown that the cognitive-psychological paradigm, while enormously influential, cannot on its own account for the full reality of medical reasoning. It has illuminated the mental operations involved in diagnosis but at the cost of abstracting reasoning from the relational, linguistic, and moral dimensions that define medical practice. What emerges from this limitation is a pressing need to re-humanize reasoning, to restore its interpretive and dialogical depth, and to situate it once again within the lived encounter between physician, patient, and technology.

Pedagogically, this reframing implies a shift from teaching reasoning as an abstract cognitive skill to cultivating it as a form of phronesis—practical wisdom exercised in uncertain, value-laden contexts. Clinical reasoning education must therefore emphasize apprenticeship, mentorship, and reflective dialogue rather than algorithmic exercises or decontextualized case simulations. Students should be trained not merely to think about patients but to think with them—to interpret narratives, recognize the moral stakes of decisions, and engage technology as a partner in understanding rather than a substitute for judgment. This calls for new curricula that integrate clinical philosophy, narrative medicine, and critical technology studies into the heart of medical education.

The implications extend beyond pedagogy to research. Future studies should explore how dialogical and embodied reasoning can be operationalized without reductionism: how to assess interpretive skill, how to train clinicians to navigate the interplay between human and machine reasoning, and how to model the integration of patient narratives into epistemic processes. Interdisciplinary inquiry between cognitive psychology, hermeneutics, phenomenology, and AI ethics could yield novel insights into the structure of clinical understanding. Likewise, empirical research must investigate how rehumanized pedagogical approaches—such as reflective team

reasoning, embodied simulation, or narrative feedback—affect diagnostic accuracy, empathy, and patient outcomes.

This paper does not claim to have fully *humanized* clinical reasoning, but rather to have shown why and how such rehumanization is both necessary and possible. Through philosophical analysis, it exposes how the cognitive paradigm has abstracted reasoning from the lived realities of patients and the moral responsibilities of physicians. By integrating insights from the non-positivist philosophy of science, the normative philosophy of medicine, and the critical philosophy of technology, the Tri-P model provides a conceptual scaffold for future empirical and educational exploration. Through reframing reasoning as phronesis rather than algorithmic cognition—the paper proposes a framework in which understanding, dialogue, and care regain their central place. However, the work of humanizing clinical reasoning is inherently ongoing. It cannot be achieved solely through conceptual reformulation but must also be enacted in pedagogy, institutional culture, and clinical practice. The Tri-P model offers a philosophical foundation for this transformation, but its realization requires educators and practitioners to cultivate dialogical, embodied, and ethically responsive forms of reasoning in everyday medicine. In this sense, the paper does not conclude the process of rehumanization—it opens the philosophical and pedagogical space in which it can begin. The task ahead is to translate this philosophical framework into pedagogical practice—developing curricula, assessment methods, and clinical environments that cultivate interpretive dialogue, moral discernment, and technological reflection. In this sense, rehumanization is not an endpoint but a continuing horizon of inquiry.

The reconfiguration proposed here is not a rejection of cognitive science but its expansion. The future of reasoning lies in synthesis, not substitution—in uniting empirical precision with philosophical depth. The Tri-P model envisions a medicine that is intellectually rigorous yet humanly attuned, technologically sophisticated yet morally grounded. If embraced, this integrative paradigm could open new horizons for both the theory and teaching of clinical reasoning, ensuring that the next generation of physicians inherits not only the skills of thinking but the wisdom of understanding.

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