

Clinical Decision Support: When the Correct Output Is No Output

A clinical decision support pipeline that cannot obtain a required input still tends to emit a number, because absence has no representation of its own and any absent value in a numeric pipeline eventually acquires a default. The mirror failure is just as damaging: a service that correctly abstains gets scored for it, by availability metrics and suppression counters that read silence as defect. U.S. Provisional Application No. 64/117,812 discloses abstention as a first-class, typed outcome carried under a conversion bar that forecloses turning it into a scalar, a default, a threshold operand, or a consequence adverse to any party, together with a signed attestation that carries a withholding between systems without it arriving as failure.

1. A Missing Lab Value Is Not a Normal Lab Value

A deterioration model scores a patient on a panel that is one analyte short. The interface carrying results back from the laboratory has gone quiet, and the model has no way to know it. It reads a field, the field holds nothing, and between the interface and the score that nothing becomes a number: a population median, a last observed value, a zero. The score returns inside the reassuring band.

Three different situations collapsed into one representation along the way. The value was never collected; the value exists but the transport is down; or an upstream system deliberately stopped producing values of that kind, because it is degraded or awaiting a review. A clinician told which of the three occurred would act differently in each case, and the score carries none of it.

The mirror problem sits one layer out. When a clinical service declines to produce an output it cannot ground, consuming systems tend to record that decline as a defect: an error rate, an availability metric, a suppression counter. Correct abstention is expensive to whoever performs it, so the standing incentive is to emit something.

2. Why Null Handling, Suppression, and Uptime Metrics Land in One Place

The familiar remedies share a single move: each converts absence into a value.

Imputation is the explicit case, long described in publicly available clinical informatics literature as a hazard where missingness is not random, and an interface outage sits close to the definition of not random. Fail-open and fail-closed conventions are the same conversion with the sign flipped. Suppression logic converts absence into a decision not to interrupt, which the record preserves as the absence of a concern rather than the absence of an input.

The reason none of these hold is representational. Absence is modeled as a missing value of an ordinary type: a nullable number, an optional field, a sentinel. Anything modeled that way eventually meets code that wants a number, and that code either crashes or supplies one.

For the cross-organization case we are aware of no settled answer. Integration practice, as publicly described, gives one system no way to tell another, verifiably, that it is withholding a class of action without the message arriving as an error or a health-check

failure. The receiver marks the sender degraded, accumulating evidence against a peer behaving correctly.

3. Abstention as a Typed Outcome, and the Bar That Keeps It One

Chapter 5 of the filed provisional sets an invariant: where an input required by a determination is unavailable, incomplete, or unresolvable, the determination emits an outcome entry of a recorded abstention class identifying the unavailable input, and emits no outcome adverse to the semantic agent, to an asserting party, or to a counterparty. A **degradation map** enumerates, per determination stage, the input required, the abstention outcome produced upon unavailability, and the consequence foreclosed. A lineage-unavailable path produces the not-determinable determination and forecloses the rejected determination, which issues only upon an affirmative contradicting entry. A policy-unresolved path produces no determination at all, appends the conduct evaluation artifact as pending, and generates a structured inquiry. One declared exception sits at the reason-type-unresolved path, where an unresolvable reason-type produces a modification bounded to the non-zero minimum declared in the signed policy object, the consequence foreclosed there being a magnitude of zero rather than an adverse one.

The **conversion bar** keeps such an outcome from decaying back into a number. It forecloses a consuming determination from converting an abstention outcome into a scalar value, a default value, an operand of a threshold comparison, or a consequence adverse to any party. The foreclosure is affirmative rather than an absence of defined behavior: the outcome entry and a magnitude are values of disjoint types, and no total function maps the former to the latter. A threshold comparison of the entry emits an outcome of the recorded abstention class and not a Boolean; an accumulation over a set containing it emits an abstention outcome and not a sum over the remaining members. In an embodiment the discipline is enforced statically upon the agent's instructions before they execute, so the conversion is not constructible rather than caught at the attempt.

Such outcomes propagate. Each is appended to the append-only lineage field as a first-class outcome entry carrying the abstention class, the stage that produced it, the unavailable input, and a recorded time. A determination consuming one emits an abstention outcome of its own recorded class, never replaced, resolved, or defaulted at any stage, so the originally unavailable input stays recoverable by following the chain. Withholding crosses the boundary between systems as a **non-execution attestation**: a signed governed observation carrying the withheld action-class enumeration, an enumerated evidentiary basis, an attested epoch drawn from the emitting agent's own hash chain rather than from a clock available to its host, an abstention-class type marker carrying a type designation and not a magnitude, and an express non-determination designation declaring the attestation neither a determination nor a denial of any dispatch.

4. Walking an Order Through a Pipeline That Refuses to Guess

Consider the allergy check on a medication order. The append-only lineage field holds nothing on the substance in question, the lineage-unavailable path applies, and the admission evaluator produces the not-determinable determination. What matters clinically is the consequence foreclosed: the rejected determination is unavailable at this path, a rejection issuing only upon an affirmative contradicting entry. Silence cannot become "no known allergy." It becomes a recorded, typed statement that the allergy record was the input that could not be obtained, attached to this order.

Push that outcome into the composite score. The consuming determination takes several inputs of which one is an abstention outcome, so it emits an abstention outcome of its own recorded class identifying the one consumed. The threshold that would have decided whether to interrupt the clinician emits an outcome of the recorded abstention class and not a Boolean; the accumulation that would have summed the remaining panel terms emits an abstention outcome and not a sum over the members it does hold. No band, no color, no percentile. What surfaces for review is a recorded outcome naming the stage and the unavailable input, traceable back to the quiet interface.

Some determinations depend on a person, not on data. Where the policy object in force conditions a determination upon participation, review, acceptance, or receipt by a counterparty of an enumerated class, and the records held for the scope partition contain no admissible member, the counterparty-absence path produces a third outcome: neither execution of the action nor denial of it. The agent transitions into the non-executing cognitive mode, weighs delegation alternatives without committing state changes, and emits a structured inquiry to its principal, without a write of the authorization gate, naming the absent class and the alternatives that would satisfy the requirement. Both are appended to the per-partition lineage record, and the partition capability envelope contracts through coupled fields until an admissible member is recorded.

Between two systems the sequence runs like this. A clinical agent that has written its authorization gate to the withheld state for an enumerated set of action classes, and has transitioned into the non-executing cognitive mode, emits its non-execution attestation to each counterparty recorded as having dispatched to it within the emission window declared in its signed policy object, and to no other party. The receiver verifies the authority credential and continuity hash under the trust-slope validator, tests the attested epoch as a valid successor, and confirms that the abstention-class type marker resolves within the closed enumeration declared in its own policy object. Only on a satisfied verification does it write a carried abstention entry as a value of the abstention type, adopting that designation as received rather than re-deriving or defaulting it.

Four conversions the receiver would ordinarily perform upon a failure are foreclosed:

- No availability score, health quantity, suspicion level, or failure rate of the receiving agent takes the carried entry as an input.
- No refusal counter, assertion-cost counter, or refusal meter of the disclosing agent is incremented, and the receiver maintains no counter, in any unit, advanced by receipt of such an attestation.

- Nothing recording fault, breach, unreliability, degraded standing, or diminished trust is appended to the disclosing agent's counterparty identity record.
- Subsequent non-response to a dispatch in a withheld class is recorded as a not-determinable outcome naming that class as the unavailable input, resolving nothing against either party, irrespective of how many such non-responses occur and over what interval.

The receiver's dispatch-authority predicate is recomputed at each request to dispatch, and fails where the requested action is of an enumerated class and the intended counterparty is the disclosing agent. That failure is recorded as a positive abstention, in a dispatch-authority abstention record naming the withheld dispatch, the action-class identifier, and the entry relied upon, with no determination that the dispatch was impermissible and no fault of either agent. It is confined: other classes, other counterparties, and the receiver's own execution of such actions are unaffected, and its own gate stays unwritten.

Two details matter for clinical timing. An order transmitted before the entry is admitted is neither recalled nor canceled: an in-flight dispatch abstention record is appended, a later response is consumed in the ordinary way, and an absent one is recorded as a not-determinable determination naming the withheld class. Where a required feed stays quiet, the agent keeps in that counterparty's identity record an abstention-attribution count of outcomes produced within a declared interval whose unavailable input was a response, record, or receipt required of that counterparty, a count that moves no scoped integrity vector, increments no refusal counter, causes no gate write, and is no operand of an adverse threshold comparison. Should that count exceed a bound declared in the signed policy object, the agent emits a structured inquiry to its principal naming the counterparty and the persistently unavailable input, so the gap reaches people who can fix it with nobody recorded as at fault.

5. Integration Reality and the Open Problems

The foreclosure holds for code written inside the type discipline. A component built outside it, reading an outcome entry through a generic interface and coercing it, would sit outside that discipline, so the practical integration question is where the boundary runs.

The architecture says nothing about whether the clinical judgment is correct; it governs the representation of absence, not the quality of presence. Nor does it fill the gap: no imputation of last resort, no substitute value, no fallback that quietly restores a number. When the input is unavailable the product is a recorded abstention, and someone has to act on it. The structured inquiry goes to the principal, not the bedside, and routing it to a person who can answer is deployment work.

Attestations require identity infrastructure: a counterparty identity record with a continuity history store on the receiving side, and maintained epoch continuity on both hash chains. A missing predecessor epoch produces a predecessor-absence abstention outcome rather than a verification success, and an attestation presented outside the attestation window declared in the receiving agent's signed policy object produces an attestation staleness outcome rather than a rejection. Both are correct behaviors, and both are states an operations team must learn to read.

Release is narrow in the embodiment recited, which will frustrate people. A carried abstention entry is released as to an action class upon presentation of an unmarked execution record of the disclosing agent in that class, upon a superseding attestation omitting the class and carrying a successor attested epoch, or upon elapse of the time-to-live field, and that elapse is expressly no evidence the class has been restored. No accumulation of the receiver's own dispatch attempts, non-responses, or abstention outcomes releases the entry, so a team cannot clear a withholding by retrying into it.

Expect the measured abstention rate to look bad at first. It was always there; conversion hid it. Visibility alone reduces no alert burden and repairs no quiet interface. The absence is now a recorded outcome with a name and a stage attached, not a number nobody can trace.

6. Disclosure Scope

This article is published as a defensive disclosure establishing public, timestamped prior art for applying the disclosed architecture to clinical decision support and interoperability.

The mechanisms described are disclosed in U.S. Provisional Application No. 64/117,812, at Chapter 5, "Adverse-to-No-Party Abstention and the Conversion Bar": the abstention invariant and degradation map at Sections 5.1 and 5.2, propagation at 5.3, the conversion bar and its type discipline at 5.4, the third outcome upon absence of an admissible counterparty class at 5.5, the non-execution attestation at 5.6, verification and admission as a value of the abstention type at 5.7, the conversion bar across the agent boundary at 5.8, and the dispatch-authority predicate and release conditions at 5.9. Further embodiments described above, including the in-flight dispatch abstention record, the attestation window parameter, and the abstention-attribution count, appear in Section 10 of the same application.

The filings in this portfolio are pending applications. Nothing here asserts that any system, product, or practice falls within their scope, and nothing states that any party requires a license.

Refusing to act is a first-class, recorded outcome — and can't be laundered into acting.

Provisional application

PRIMARY TECHNICAL DISCLOSURE

- [Positive Abstention: Withholding as a First-Class, Non-Convertible Outcome \(/articles/positive-abstention/withholding-as-a-first-class-outcome\)](/articles/positive-abstention/withholding-as-a-first-class-outcome).

SECONDARY TECHNICAL

- [Relay Non-Execution Attestation With Depth and Cycle Bounds \(/articles/positive-abstention/relay-non-execution-attestation\)](/articles/positive-abstention/relay-non-execution-attestation).
- [The Anti-Amplification Bound on Propagated Determinations \(/articles/positive-abstention/anti-amplification-magnitude-bound\)](/articles/positive-abstention/anti-amplification-magnitude-bound)
- [The Attestation Revocation Object \(/articles/positive-abstention/attestation-revocation-object\)](/articles/positive-abstention/attestation-revocation-object)
- [Empty-Intersection Mutual Positive Abstention \(/articles/positive-abstention/empty-intersection-mutual-abstention\)](/articles/positive-abstention/empty-intersection-mutual-abstention).
- [Curing Counterparty Absence by Introduction Protocol \(/articles/positive-abstention/introduction-protocol-cure\)](/articles/positive-abstention/introduction-protocol-cure)

APPLICATIONS • GENERAL

- [Safety-Critical Autonomy: Recording a Refusal to Act as a First-Class Outcome \(/articles/positive-abstention/safety-critical-autonomy-abstention\)](/articles/positive-abstention/safety-critical-autonomy-abstention)
- [Clinical Decision Support: When the Correct Output Is No Output \(/articles/positive-abstention/clinical-decision-support-abstention\)](/articles/positive-abstention/clinical-decision-support-abstention)

APPLICATIONS • SPECIFIC

- [NIST AI Risk Management Framework: Where Abstention Fits in Agent-to-Agent Conduct \(/articles/positive-abstention/nist-ai-rmf-abstention\)](/articles/positive-abstention/nist-ai-rmf-abstention).

TERMINOLOGY

- [abstention outcome \(/glossary#abstention-outcome\)](/glossary#abstention-outcome).
- [conversion bar \(/glossary#conversion-bar\)](/glossary#conversion-bar).
- [non-execution attestation \(/glossary#non-execution-attestation\)](/glossary#non-execution-attestation).
- [positive abstention \(/glossary#positive-abstention\)](/glossary#positive-abstention).

Positive Abstention and the Conversion Bar overview → (/positive-abstention).