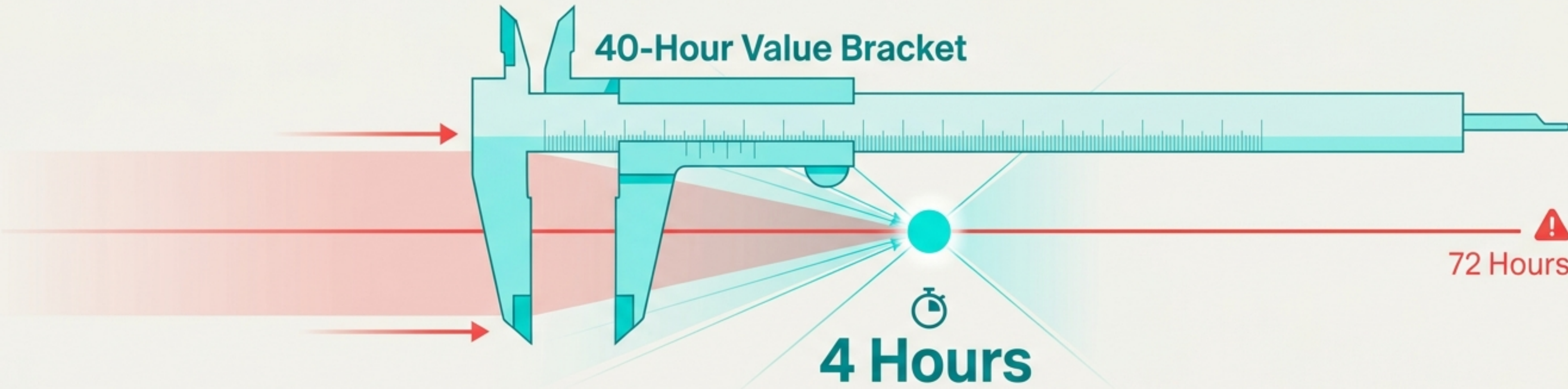


Predicting resistance and protecting patients 40 hours earlier.



1	2	3
Platform: AEGIS-SG (Antimicrobial Early Guard & Intelligence System) Governed clinical AI for Singapore hospitals.	Target Metrics: AUROC 0.955 F1 0.870 Accuracy 88.7%	Regulatory Framework: HSA SaMD Pathway (Ref: TFDA NO.008372)

Advanced diagnostics cannot overcome a 72-hour culture bottleneck.

[Data Tier: T1]

The Action



Organism identified: 2–4 hours

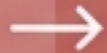
BRUKER MALDI-TOF
Mass Spectrometer

72 Hours:
Final AST Result

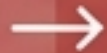
Culture-Based Susceptibility Testing (AST) Wait Time

The Consequence

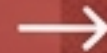
Physician
guesses
empiric
therapy



Patient
deteriorates
on ineffective
antibiotics



Broad-spectrum
agents drive
C. difficile risk



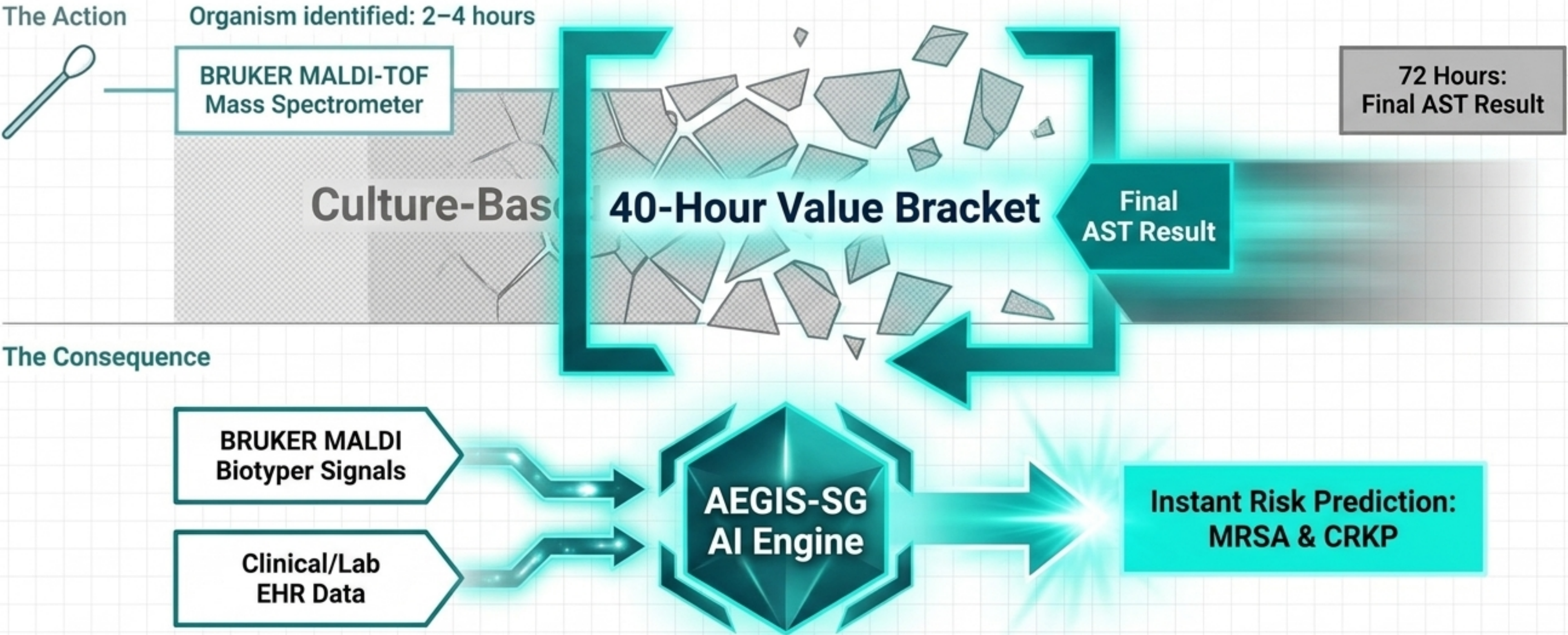
Pharmacy
costs
escalate

**“I start empiric therapy on
incomplete information and find
out 3 days later I was wrong.”**

— Dr. Sarah Lim, Infectious Diseases

AEGIS-SG collapses the waiting period into a 4-hour precision alert.

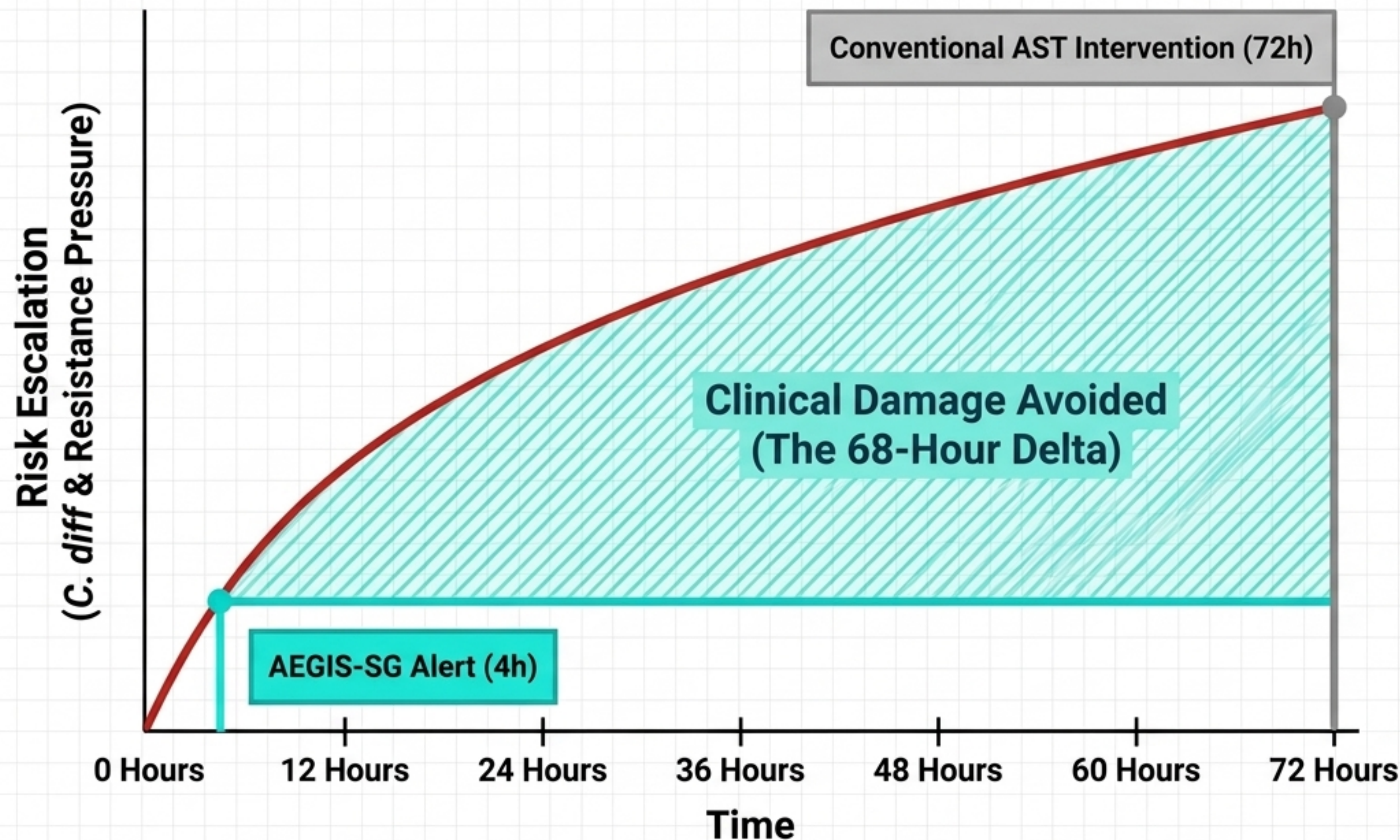
[Data Tier: T1]



By shifting the intelligence left, AEGIS-SG surfaces resistance risk at the exact moment the organism is identified. Time is the product.

Every hour saved actively halts resistance pressure and clinical deterioration.

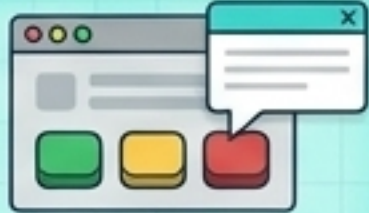
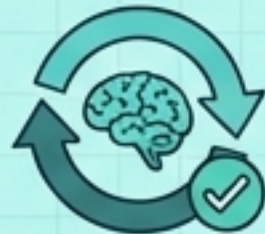
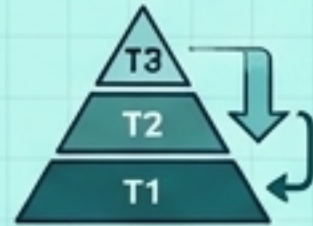
[Data Tier: T1]



Singapore's national AMR strategic action plan requires early, precise therapy. This time-compression is the mathematical mechanism to achieve it.

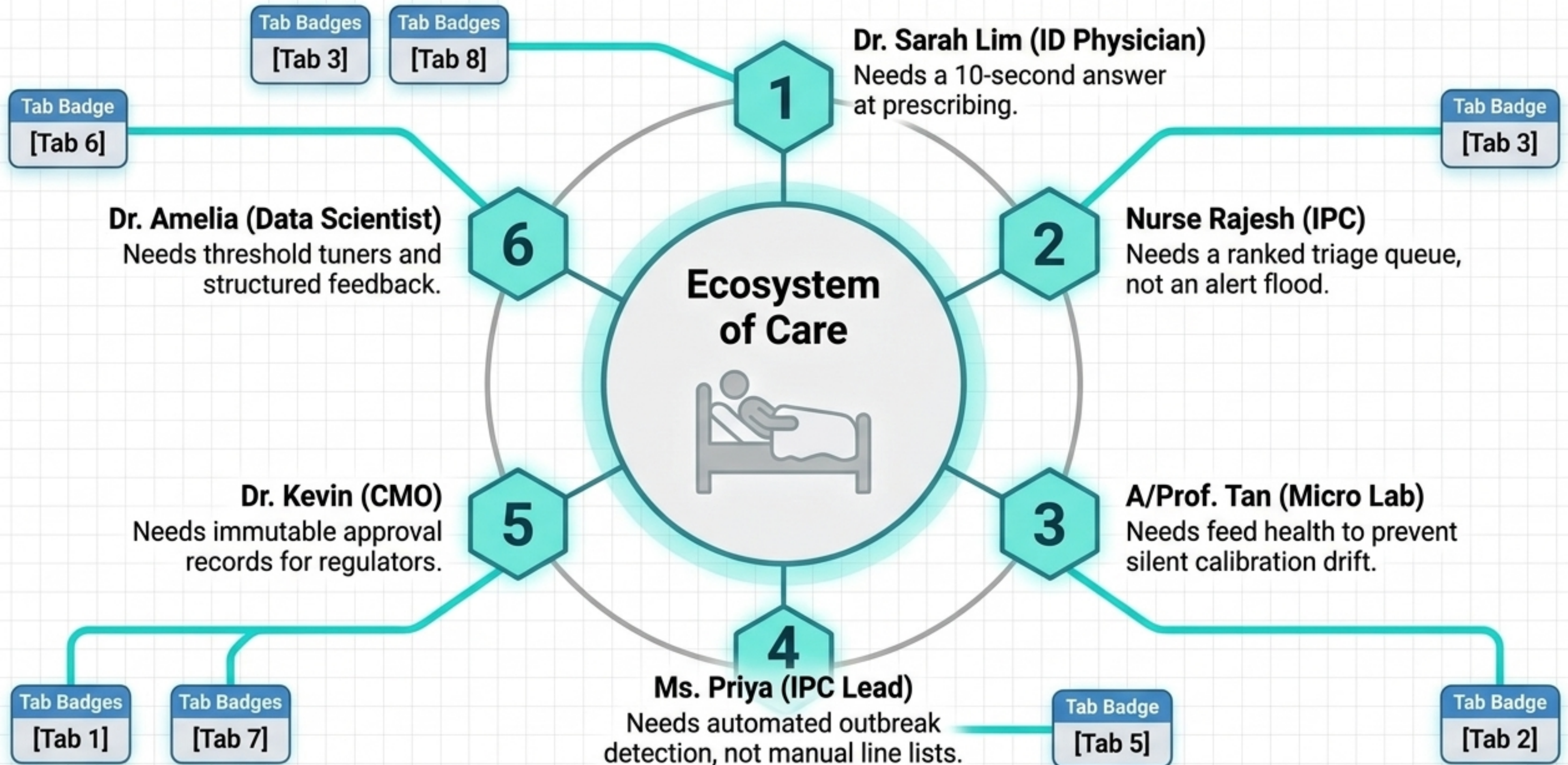
Governed clinical AI structurally outperforms conventional alerting models.

[Data Tier: T1]

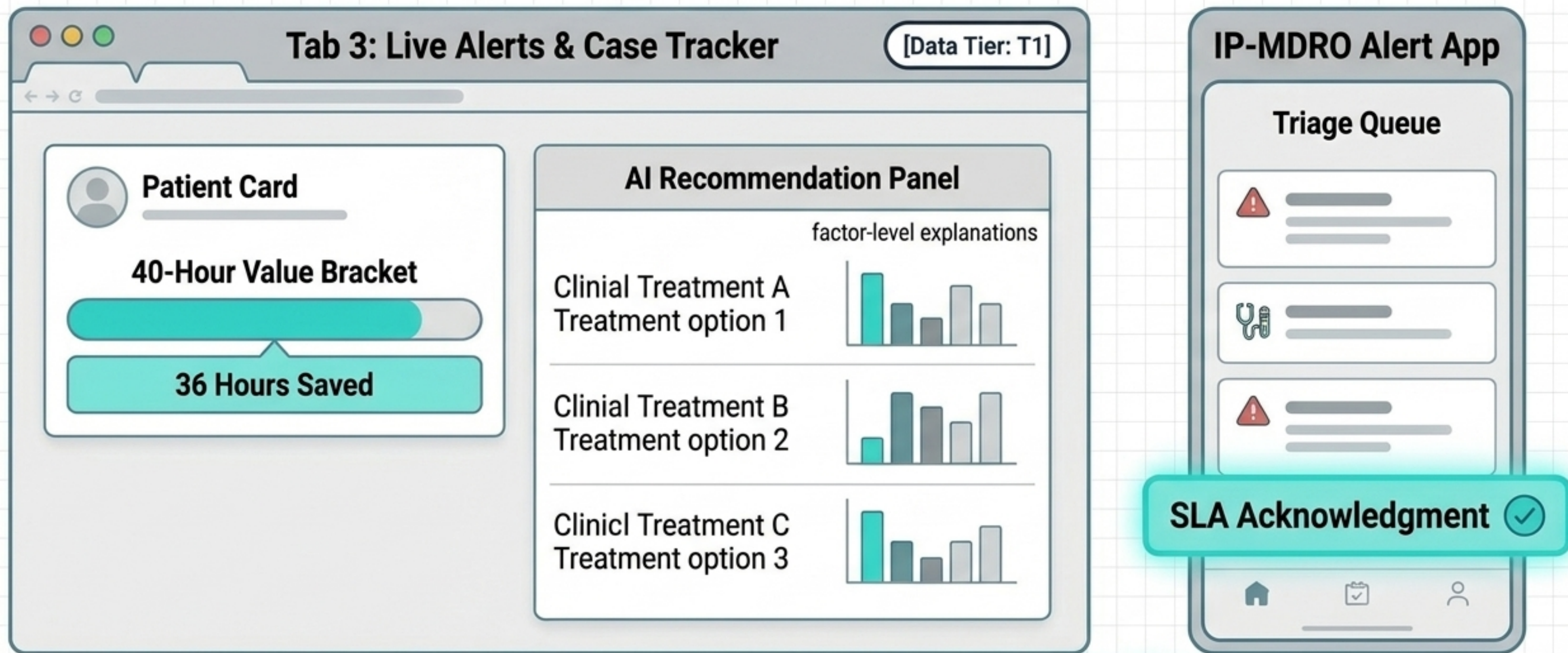
	Conventional Black Box Models	The AEGIS-SG Paradigm
Output	Raw probability score (fire and forget) 	Actionable 3-option panel with factor-level explanations 
Feedback	Open loop (untracked) 	Closed Feedback Flywheel (auto-labeled ground truth) 
Governance	Post-hoc manual audits 	Embedded Multi-Agent Approval Gates (SHA-256 chain) 
Data	Mixed production data 	Strict T1/T2/T3 tier badging 
Action	Prescriptive (AI dictates) 	Architectural Physician Discretion (AI recommends) 

Design Principle: The system advises, the human decides.
Physician discretion is hard-coded into the architecture.

A precision platform tailored to every stakeholder in the ecosystem of care. [Data Tier: T1]



Actionable intelligence reaches the bedside at the exact moment of prescribing. [Data Tier: T1]

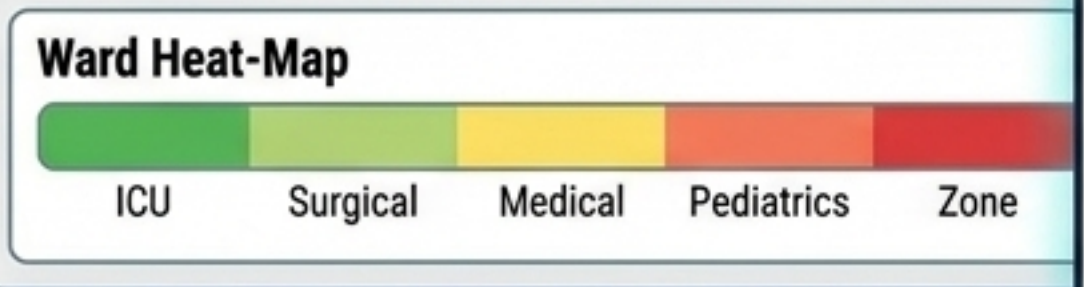
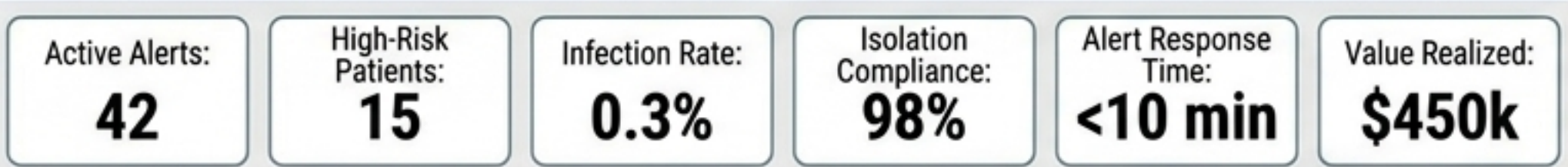


Interaction Contract: Every alert requires an SLA acknowledgment. Aggregate queue -> single case -> outcome logging in ≤ 3 clicks.

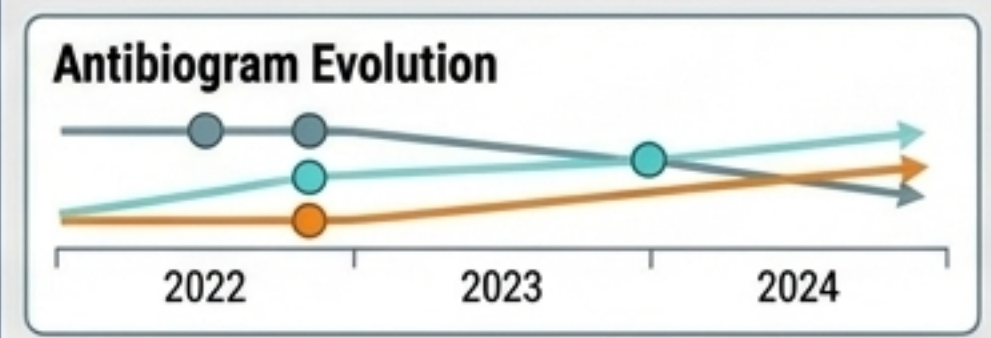
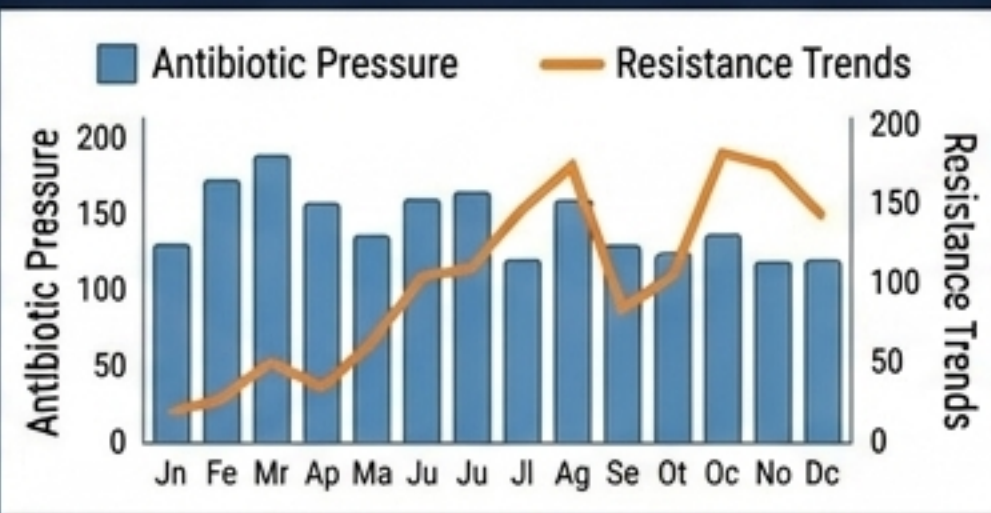
Transforming localized alerts into hospital-wide strategic intelligence.

[Data Tier: T1]

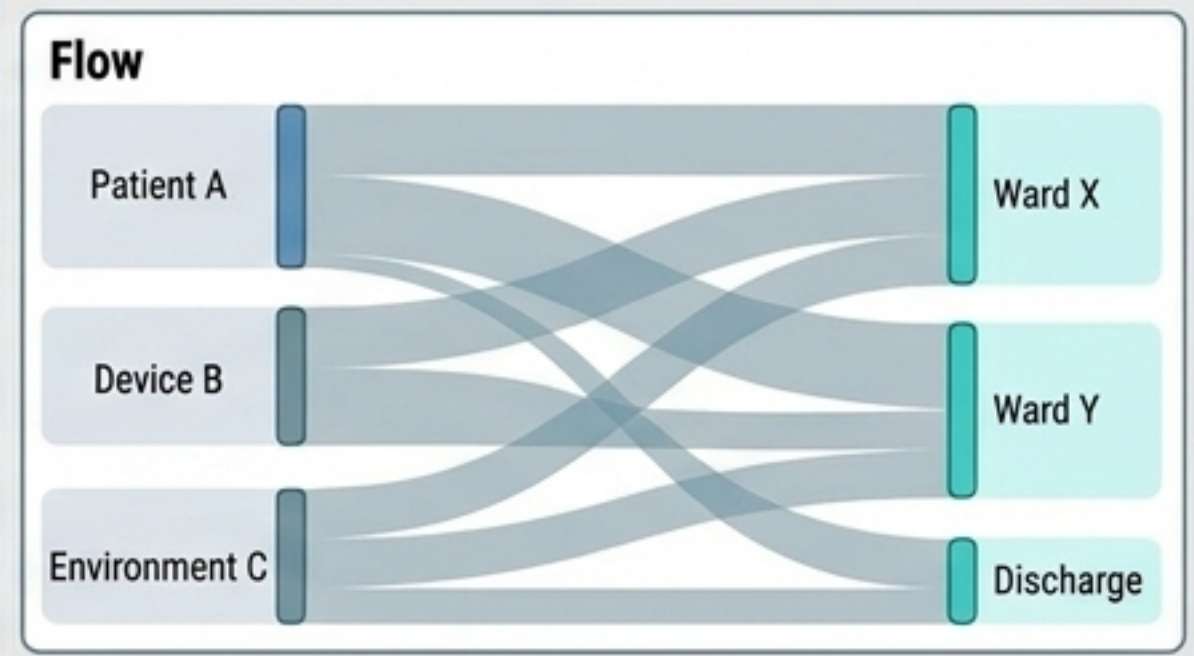
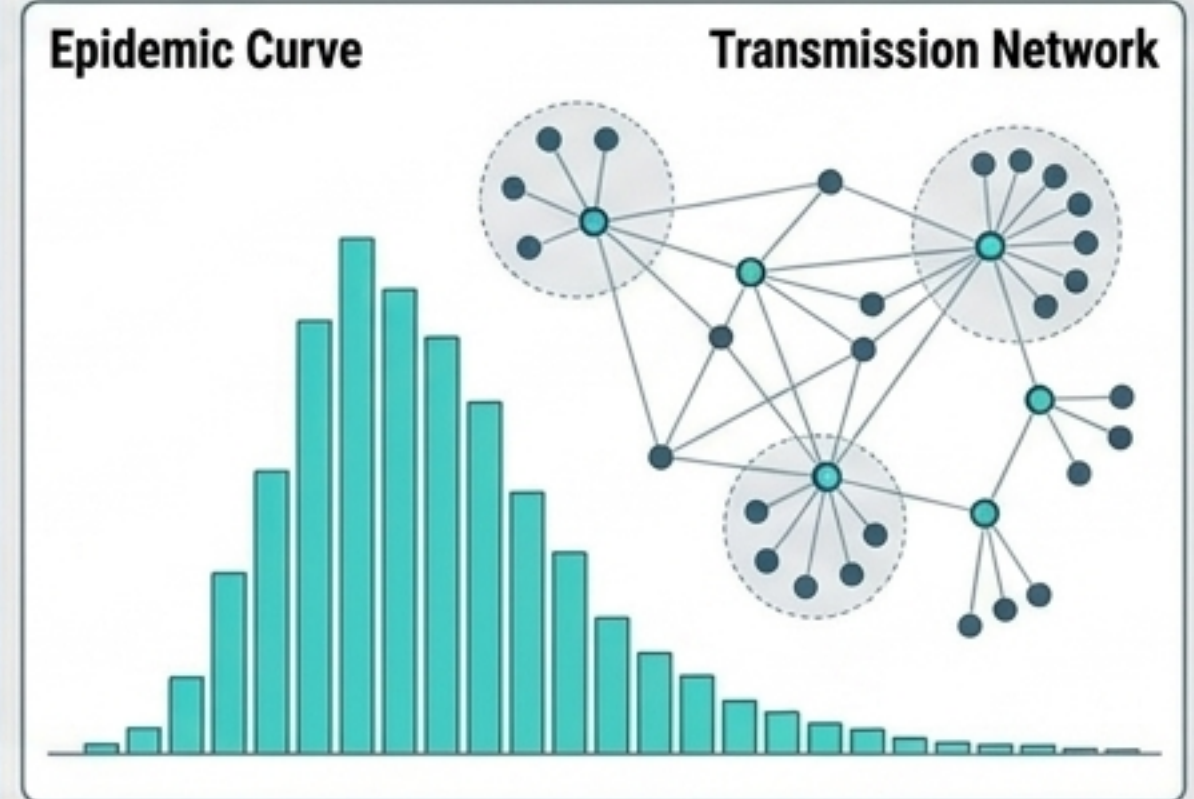
Tab 1: Executive Command Center



Tab 4: Resistance Analytics



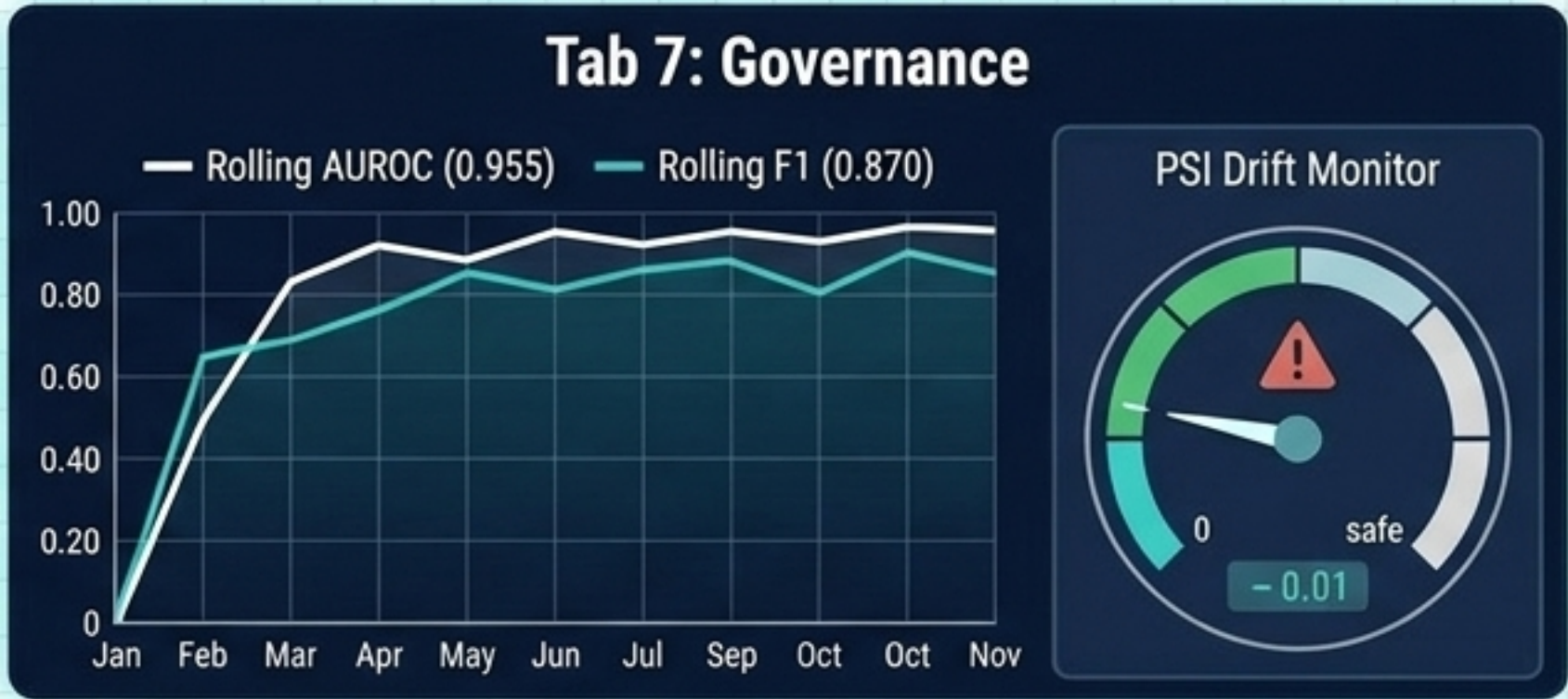
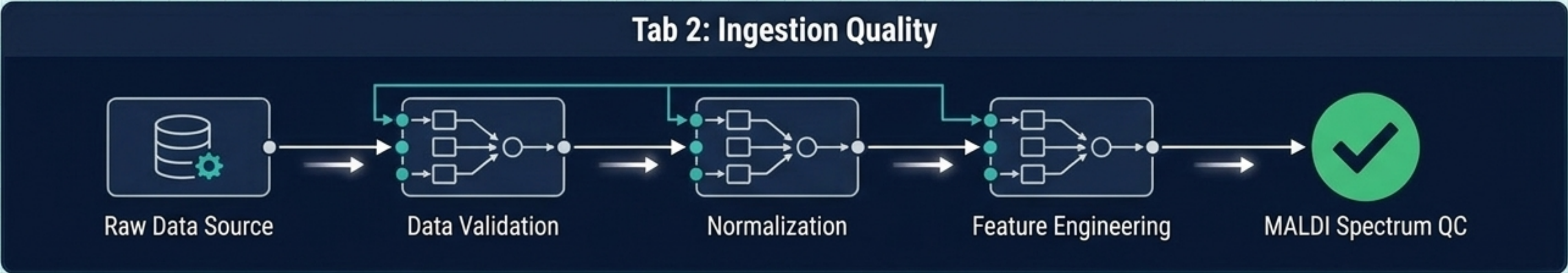
Tab 5: Outbreak & Detection



Replacing two-week delayed manual line lists with **live intervention Gantt charts** against active epidemic curves.

Continuous monitoring prevents silent calibration drift and data decay.

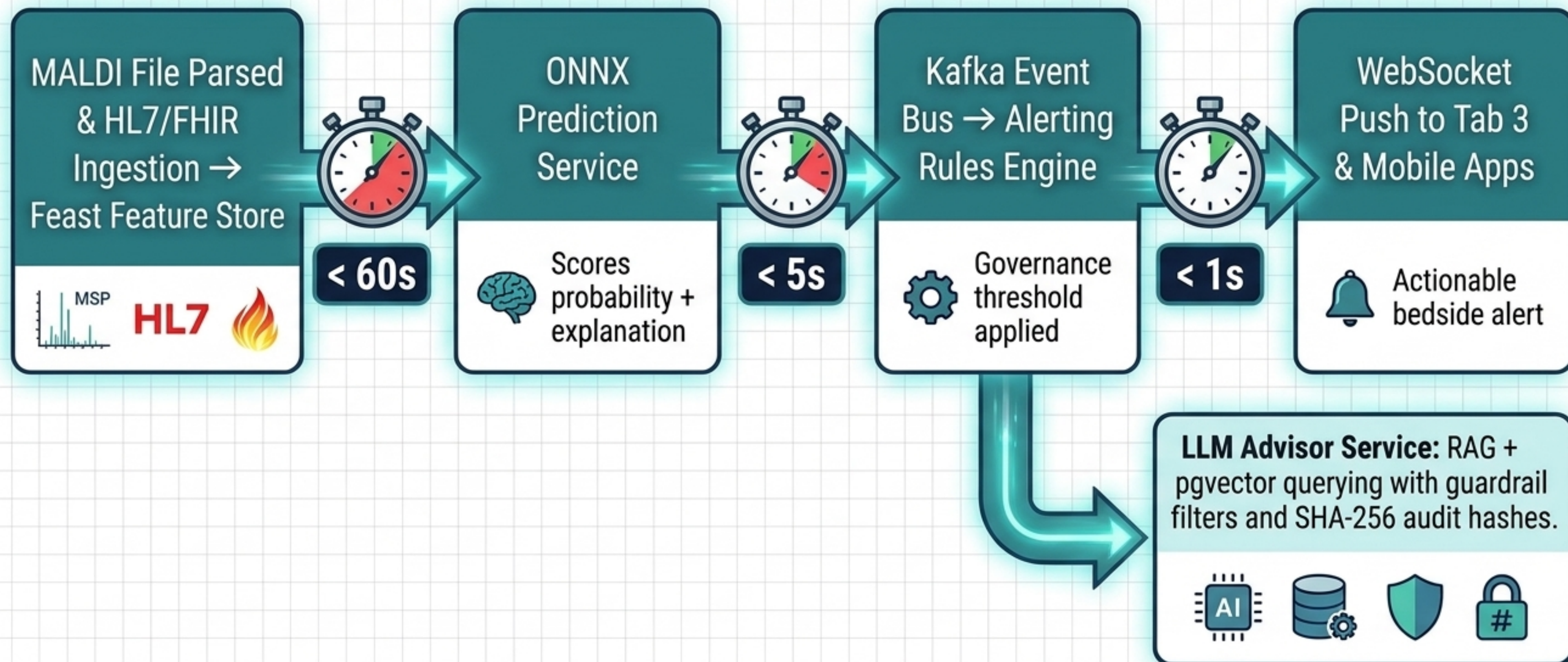
[Data Tier: T1]



Safety Guarantee: Every data point is monitored. If the MALDI instrument recalibrates causing schema drift, the system triggers an instant alarm and gracefully degrades to fallback.

An architecture designed to convert mass-spectrometry signals into clinical action in under 15 minutes.

[Data Tier: T1]



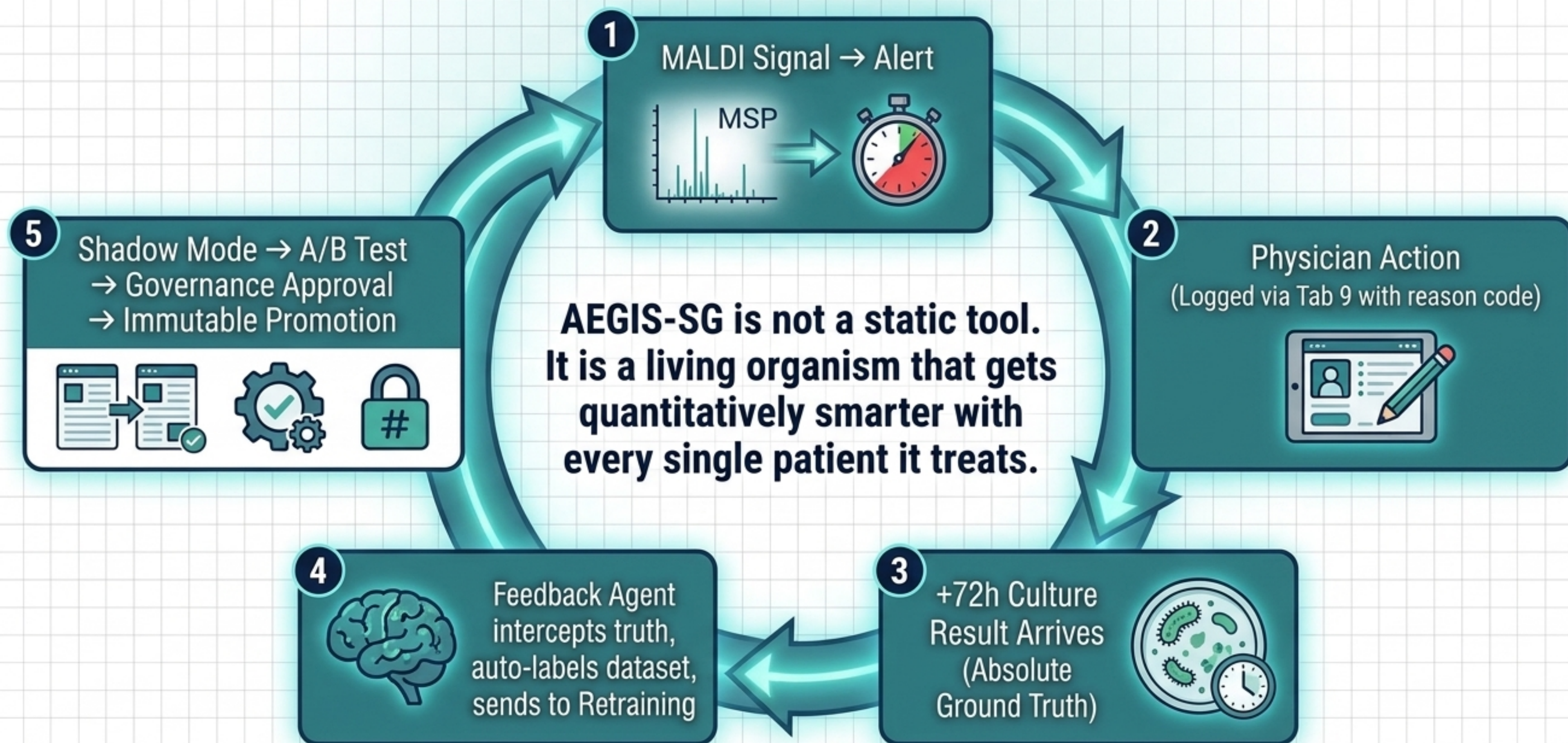
Eight embedded **AI agents** actively manage prediction, safety, and surveillance.

[Data Tier: T1]



Ground truth from the laboratory creates a **self-improving** clinical **flywheel**.

[Data Tier: T1]



Strict **data tiering** ensures synthetic testing never contaminates production metrics.

[Data Tier: T1/T2/T3]

[T1] Real: De-identified extracts.

IMPENETRABLE BARRIER

[T2] Semi-Synthetic: Real statistics + perturbation.

(Includes encoded events: E1 monsoon MRSA peak, E3 stewardship DOT -12%)

IMPENETRABLE BARRIER

[T3] Synthetic: Published epidemiology.

**Delta/Iceberg
Lakehouse
Environments**

Every single chart, metric, and record across all 9 tabs carries a hardcoded T1, T2, or T3 badge. Absolute provenance.

Immutable governance chains ensure full compliance with Singapore's regulatory frameworks.

PDPA Compliance

Addressed via PII hashing at ingestion (NRIC/MRN) and strict data minimization logs.

HSA SaMD Pathway

Met via version-controlled models, immutable approval records, and adverse-event forensics packets.

MOH / National AMR Plan

Aligned via strategic stewardship metrics, antibiograms reporting, and cluster-level governance review.

NIST / EU AI Act

Covered via risk-tier badges, human-oversight flags, and autonomous Tabs 6-7 Governance Agents.

System Core: Every config change, alert action, and LLM answer generates a tamper-evident SHA-256 audit hash.

A **staggered rollout sequence** compounding clinical and operational value.

Grounded Clinical Precision.

