

Pharmacy Call Center AI Agent Total Cost of Ownership Analysis

Representative Health-System Scenario (80,000 Calls per Year)

THE BOTTOM LINE

At this call volume, the AI agent generates net savings only when the actual EHR write-error rate remains below approximately 0.67%. At the industry benchmark of 1.2%, the solution costs approximately \$265K more per year than the human-only baseline. The difference is driven primarily by error remediation rather than vendor fees.

\$1.12M	\$14.00	0.67%	3.8x
Human-only annual cost	Fully loaded cost per call	Break-even error rate	Base-case governance ROI

Study Design

This analysis evaluates the total cost of ownership of an AI-enabled pharmacy call center using a three-arm comparative model:

- Arm A: Human-only operations
- Arm B: AI agent without governance monitoring
- Arm C: AI agent with governance and action-log monitoring

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Three Scenario Comparison

The model compares steady-state annual cost and three-year net present value across three operating assumptions. Negative annual differences indicate savings compared with the human-only baseline.

Scenario	Human only	AI agent no governance	AI agent + governance	Annual difference	3-year NPV	Outcome
Vendor claim 95% containment 0.3% error	\$1.12M	\$788K	\$761K	-\$332K	+\$760K	Positive ROI
Optimistic 80% containment 0.5% error	\$1.12M	\$984K	\$932K	-\$136K	+\$205K	Positive ROI
Industry benchmark 65% containment 1.2% error	\$1.12M	\$1.385M	\$1.248M	+\$265K	-\$928K	Higher cost

KEY OBSERVATION

Error rate is substantially more influential than vendor pricing. Even modest increases in AI error rates can eliminate projected savings and increase total operating costs.

Break-Even Error Threshold

AI containment rate	Maximum error rate that still produces savings
55%	0.63%
65% (base case)	0.67%
75%	0.71%
85%	0.73%
95%	0.75%

Key insight: Break-even performance is relatively insensitive to containment rate. Across all scenarios, AI accuracy remains the dominant driver of value realization.

Governance Value

The governance layer monitors AI actions, reduces detection delays, and limits downstream patient-impact risks.

Measure	Without governance	With governance
Error detection lag	~36 hours	<3.5 hours
Probability of harm per error	14%	8.6%
Annual error-cost savings	-	\$136K
Governance cost	-	\$36K
Net annual benefit	-	\$100K
Governance ROI	-	3.8x

Governance conclusion: Governance value scales directly with error frequency. As AI systems become more autonomous and perform more workflow actions, rapid detection and intervention become significant contributors to economic performance.

What Drives the Model

1. AI Error Rate on EHR Write Actions

The most important variable in the analysis. The error rate reflects the frequency of incorrect AI-executed EHR transactions and must be measured in the actual deployment environment. Vendor-reported performance should be independently validated.

2. AI Containment Rate

Containment is the percentage of inbound calls fully resolved without human intervention. Actual rates may differ from vendor benchmarks because of multilingual populations, clinical complexity, escalation workflows, and operating-model differences.

3. Escalation Handling Time

AI-escalated calls may require additional context review and validation, increasing average handling time compared with purely human-managed calls.

4. Error Detection Delay

The economic impact of a workflow error increases as detection latency increases. Shorter detection times reduce remediation effort, downstream operating costs, and patient-impact risk.

5. Baseline Human Costs

The human-only benchmark assumes a fully loaded operating cost of approximately \$14 per call, including labor, telephony, facilities, supervision and quality assurance, technology platforms, and indirect costs.

Representative Deployment Assumptions

The model uses assumptions representative of a mid-sized to large healthcare organization:

- Approximately 80,000 calls annually
- Approximately 60% automatable workload
- Multilingual patient population
- Pharmacy refill and status inquiries as primary automation targets
- AI-escalated calls requiring approximately 1.45x baseline average handling time

These assumptions illustrate model behavior and are not specific to any individual healthcare organization.

Methodology

Comparative study design. Arm A represents human-only operations. Arm B represents an AI agent without monitoring. Arm C represents an AI agent with governance and action-log monitoring.

Economic outputs. Results are reported as annual total cost of ownership, three-year net present value using a 3% discount rate, and governance return on investment.

AI Error Cost Calculation

Per-error cost consists of direct remediation expense plus probability-adjusted downstream impact cost. The model assumes:

- \$420 remediation cost per error
- \$8,500 downstream impact cost
- Increased risk as detection delay increases
- Error-rate sensitivity modeled from 0.1% to 2.5%

Interpretation note

This is a value-threshold analysis, not a prediction of any specific deployment. Actual outcomes depend on validated production performance, local operating costs, workflow design, patient mix, and governance controls.

Conclusion

For healthcare organizations evaluating autonomous or agentic pharmacy call-center solutions, accuracy is more economically important than automation volume.

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AI error rates determine whether projected savings are realized.
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Governance becomes increasingly valuable as autonomy increases.
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Vendor licensing costs represent a small fraction of total risk-adjusted operating cost.
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Independent measurement and continuous monitoring are required to validate production performance.



MODEL SCENARIO | 80K CALLS PER YEAR

Asher Informatics | AI-SELECT Studio | HTA & Usefulness Lab