lemnisk™

REAL TIME PERSONALIZATION FOR PHARMA

From Prescription Nudges to Intelligent Adherence Journeys

Foreword

Pharmaceutical organizations have never had more opportunities to engage patients. Advances in digital health, patient support programs, AI-driven analytics, and omnichannel engagement have dramatically expanded the ways brands can support patients throughout the treatment lifecycle.

Yet despite these investments, medication adherence remains one of healthcare's most persistent challenges.

50%

Non- Adherance Rate

of patients with chronic conditions do not take medications as prescribed

$300B

Avoidable Costs

Estimated annual avoidable healthcare costs attributed to medication non-adherence

The challenge is not a lack of communication. Patients today are surrounded by reminders, educational resources, mobile applications, patient portals, and support programs.

*The problem is that most engagement strategies remain built around **static assumptions**.*

Chapter 1: Why Adherence Remains Pharma's Biggest Challenge

The pharmaceutical industry has spent decades refining its ability to drive therapy adoption. While investments in physician engagement, awareness campaigns, and patient acquisition remain important, they address only the beginning of the patient journey. The more difficult challenge often emerges **after the prescription has been written**.

The Scale of the Problem

- Nearly 50% of patients with chronic conditions do not take medications as prescribed.
- Non-adherence contributes to $100–300 billion in avoidable healthcare costs annually, increased hospitalization rates, and reduced treatment effectiveness.
- The first year of therapy represents a critical period where patients are most vulnerable to discontinuation.

Why Patients Disengage

- Unexpected out-of-pocket costs and reimbursement delays
- Side effects creating uncertainty about treatment effectiveness
- Treatment fatigue reducing motivation over time
- Emotional concerns such as anxiety and frustration
- Lack of timely guidance during critical moments

Why Pharma Faces a Unique Adherence Challenge

Unlike retail or financial services, pharmaceutical engagement operates within a highly regulated and interconnected ecosystem. Patient journeys often involve healthcare providers, patient support programs, specialty pharmacies, payers, caregivers, and internal medical teams, each influencing treatment continuation in different ways.

Complex Ecosystem

Multiple stakeholders, providers, payers, pharmacies, and support programs must coordinate to sustain patient engagement across months or years of treatment.

Specialty Therapy Burden

Patients managing oncology, autoimmune, and rare disease therapies face a combination of clinical uncertainty, financial burden, and administrative complexity that demands support.

Long Treatment Horizons

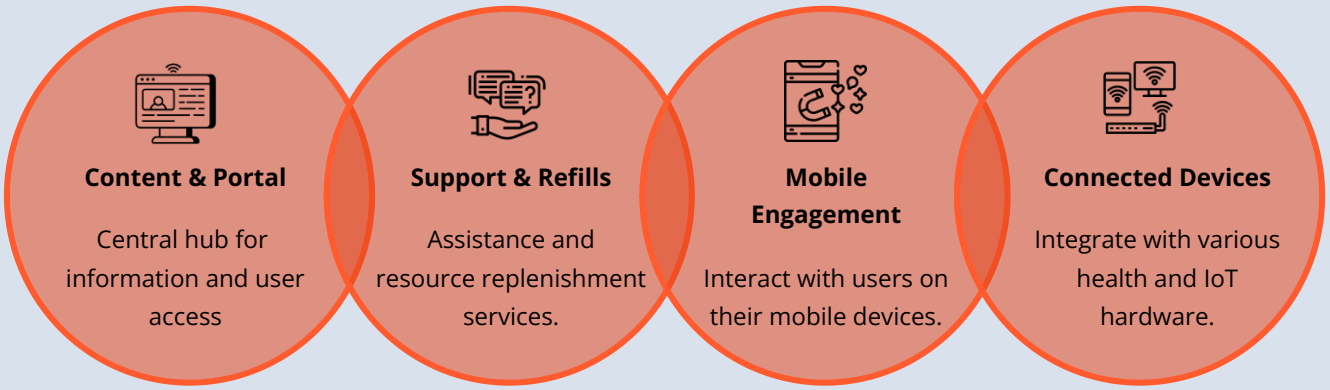
Chronic and specialty therapies span months or years. Research consistently shows meaningful patient drop-off during the first year, making early engagement and continuous education critical.

Adherence is rarely determined by a single decision. It is shaped by a series of experiences throughout the treatment lifecycle.

Chapter 2: Understanding the Real-Time Patient

A patient's needs, motivations, and challenges evolve throughout the treatment journey. Someone who begins therapy with confidence may encounter side effects a few weeks later. Another may become concerned about affordability after an unexpected insurance change. These shifts occur continuously, often long before they become visible through traditional reporting mechanisms.

Today's patients generate a continuous stream of behavioral signals:



Patient Journey Example: Early Therapy Uncertainty

Consider a patient beginning treatment for a chronic autoimmune condition. During the first month, onboarding engagement remains high. By week six, however, portal activity begins declining and searches related to side effects increase.

The Intelligent Adherence Flywheel

Successful adherence programs operate as a continuous cycle rather than a series of disconnected interventions. Each stage feeds the next, creating a self-improving adherence ecosystem capable of continuously adapting to changing patient needs.

Improving adherence requires more than reminders and outreach. It requires a deeper understanding of why patients disengage and the ability to respond with relevant support at the right moment.

This is where intelligent adherence programs differ from traditional approaches. Rather than treating engagement as a sequence of isolated activities, they operate as a continuous learning system that transforms patient signals into actionable intelligence and personalized interventions.

Patient Signals

Behavioral interactions, refill activity, content engagement, support interactions, and digital touchpoints generate valuable insight into patient needs.

Patient Intelligence

Signals are unified to create a continuously evolving understanding of patient context.

AI Decisioning

Predictive models identify risk, intent, and the next best action for each patient.

Journey Orchestration

Personalized interventions are delivered through the most relevant channel at the most appropriate time.

Patient Outcomes

Improved adherence, persistence, confidence, and engagement generate stronger outcomes.

Continuous Learning

Every outcome creates new signals that further refine future engagement decisions.

Chapter 3: Moving Beyond Reminders to Intelligent Adherence Journeys

For years, adherence programs have been built around reminders. While these approaches can be effective in certain situations, they often address only the visible symptom of disengagement rather than the underlying cause. Patients rarely discontinue therapy because they simply forgot.

The Old Approach: Action-Based

If a patient misses a dose, send a notification. If a refill is overdue, trigger an email or SMS. This responds to behavior alone, treating every patient identically regardless of the underlying reason for disengagement.

The New Approach: Intent-Based

When a patient delays a refill, the goal is not simply to prompt action. The goal is to determine **why** the delay occurred and provide support that addresses the underlying barrier whether financial, clinical, or emotional.

Consider a patient who begins searching content related to treatment side effects shortly after therapy initiation. A traditional engagement model may continue delivering scheduled onboarding communications. An intelligent journey recognizes the emerging concern and adapts accordingly to introducing educational resources, reassurance, and support options at precisely the moment uncertainty begins to grow.

> *Success is no longer measured by the number of reminders delivered. It is measured by the ability to reduce friction, strengthen confidence, and guide patients toward positive outcomes.*

The Adherence Maturity Model

Most pharmaceutical organizations operate at one of four stages of adherence maturity. Understanding where your organization sits today is the first step toward building more adaptive, intelligent engagement capabilities.

Stage 1: Reactive Engagement

Generic reminders and scheduled outreach delivered uniformly to all patients regardless of individual context or need.

Stage 2: Segmented Engagement

Patient groups receive tailored communications based on predefined characteristics such as diagnosis, therapy stage, or demographics.

Stage 3: Predictive Engagement

Behavioral signals identify adherence risks before disengagement occurs, enabling proactive rather than reactive interventions.

Stage 4: Intelligent Orchestration

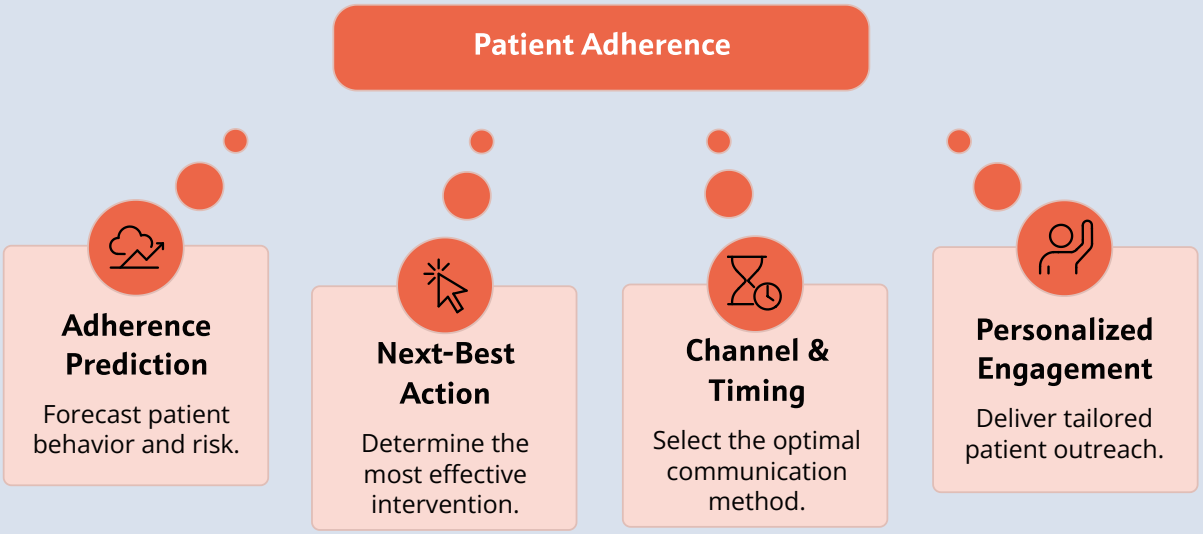
AI continuously evaluates patient context and dynamically determines next-best actions across channels. The future belongs to organizations that reach this stage.

*The future belongs to organizations that progress toward **intelligent orchestration**, where engagement evolves alongside patient needs in real time.*

Chapter 4: AI as the Intelligence Layer

As patient journeys become increasingly complex, pharmaceutical organizations face a growing challenge: making the right engagement decision at the right moment for every individual patient. The scale of this challenge quickly exceeds what can be managed through manual processes or predefined business rules. *This is where **artificial intelligence becomes a critical enabler**.*

Key AI Applications



Rather than replacing human expertise, AI amplifies it. It enables organizations to focus resources where they can create the greatest impact while ensuring that patient experiences remain timely, relevant, and personalized. The future of pharmaceutical engagement will increasingly depend on this ability to make **intelligent decisions at scale.**

The Next-Best-Action Framework

Effective personalization requires answering four critical questions for every patient at every moment. This framework transforms personalization from a communication exercise into a **decision-making capability**.

Who Needs Support?

AI identifies patients at elevated adherence risk through behavioral signals, engagement patterns, and predictive modeling.

What Support Is Most Relevant?

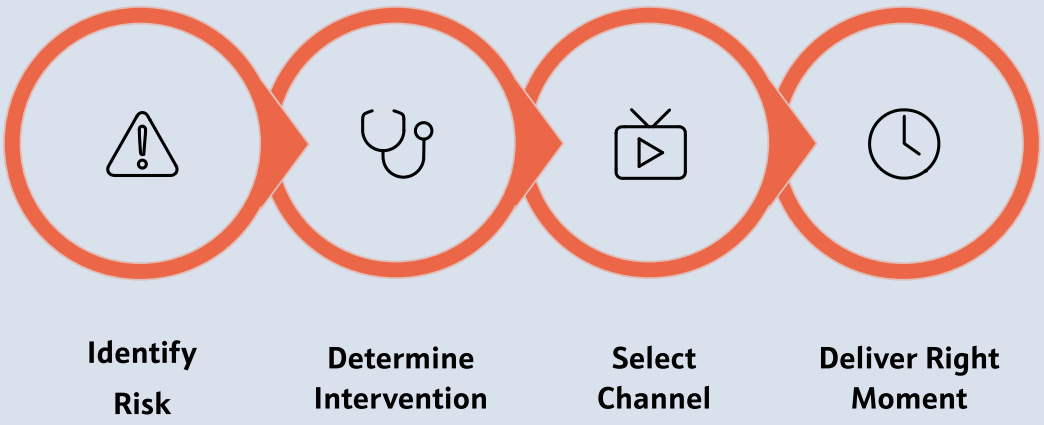
Educational content, affordability assistance, motivational reinforcement, or direct outreach from patient services teams.

Which Channel Should Be Used?

Email, SMS, mobile applications, patient portals, nurse outreach, or support programs, selected based on individual preference and context.

When Should Support Occur?

At the precise moment where intervention is most likely to influence behavior and reduce discontinuation risk.

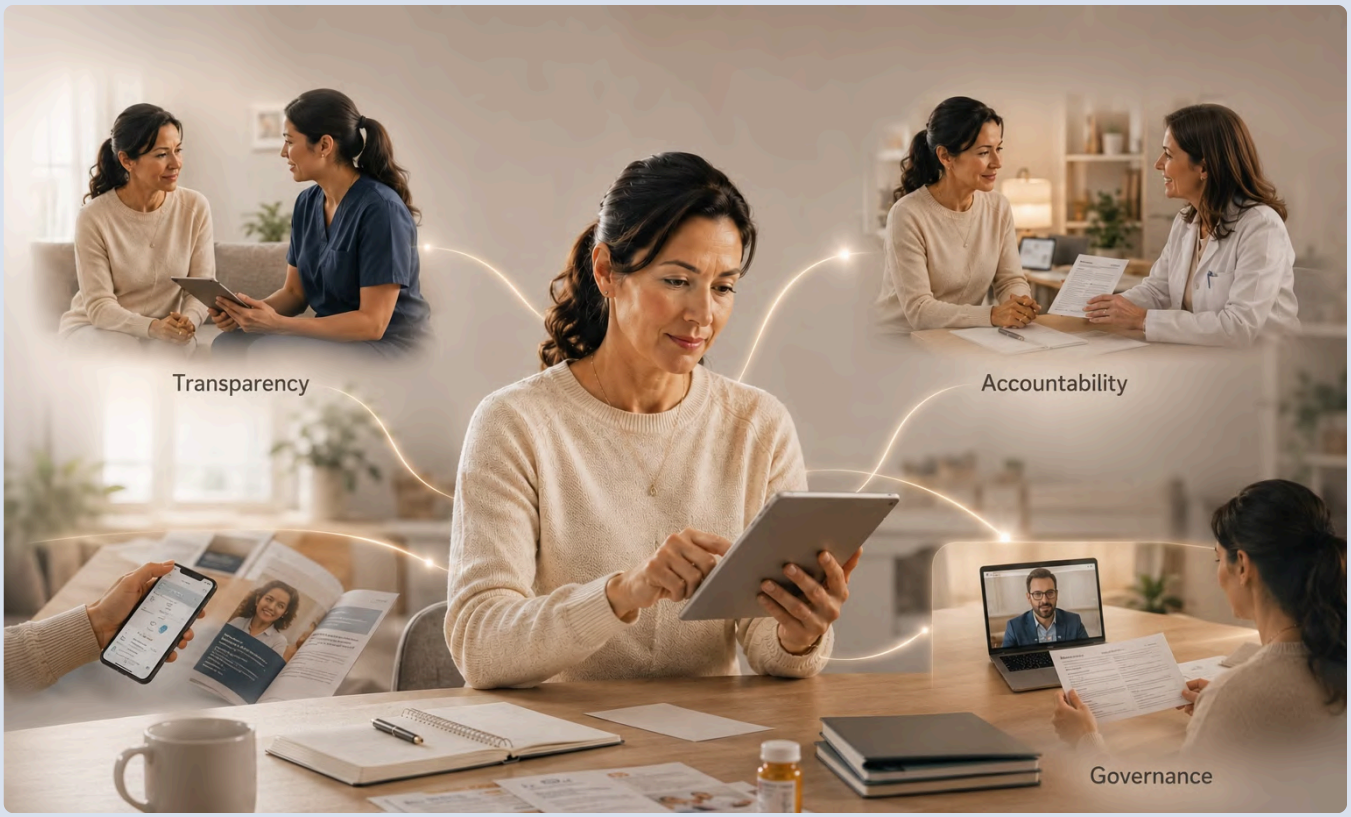


By answering all four questions simultaneously and continuously, AI-driven next-best-action models create a living decision framework that adapts as patients progress through therapy.

This shift from static communication to intelligent orchestration is what enables personalization to drive meaningful adherence outcomes at scale.

Chapter 5: Building Trust in Personalized Healthcare

As personalization capabilities become more sophisticated, patient trust is emerging as a critical differentiator. Patients are increasingly aware of how their data is collected and used, and their willingness to engage often depends on whether organizations demonstrate transparency, responsibility, and respect for privacy.



1

Transparency

Patients want clarity regarding how information is collected, how it is used, and how it is protected. When these expectations are met, personalization feels helpful and supportive rather than intrusive.

2

Accountability

AI-driven decisions must be explainable, accountable, and fair. Human oversight remains essential, particularly when engagement strategies influence healthcare experiences.

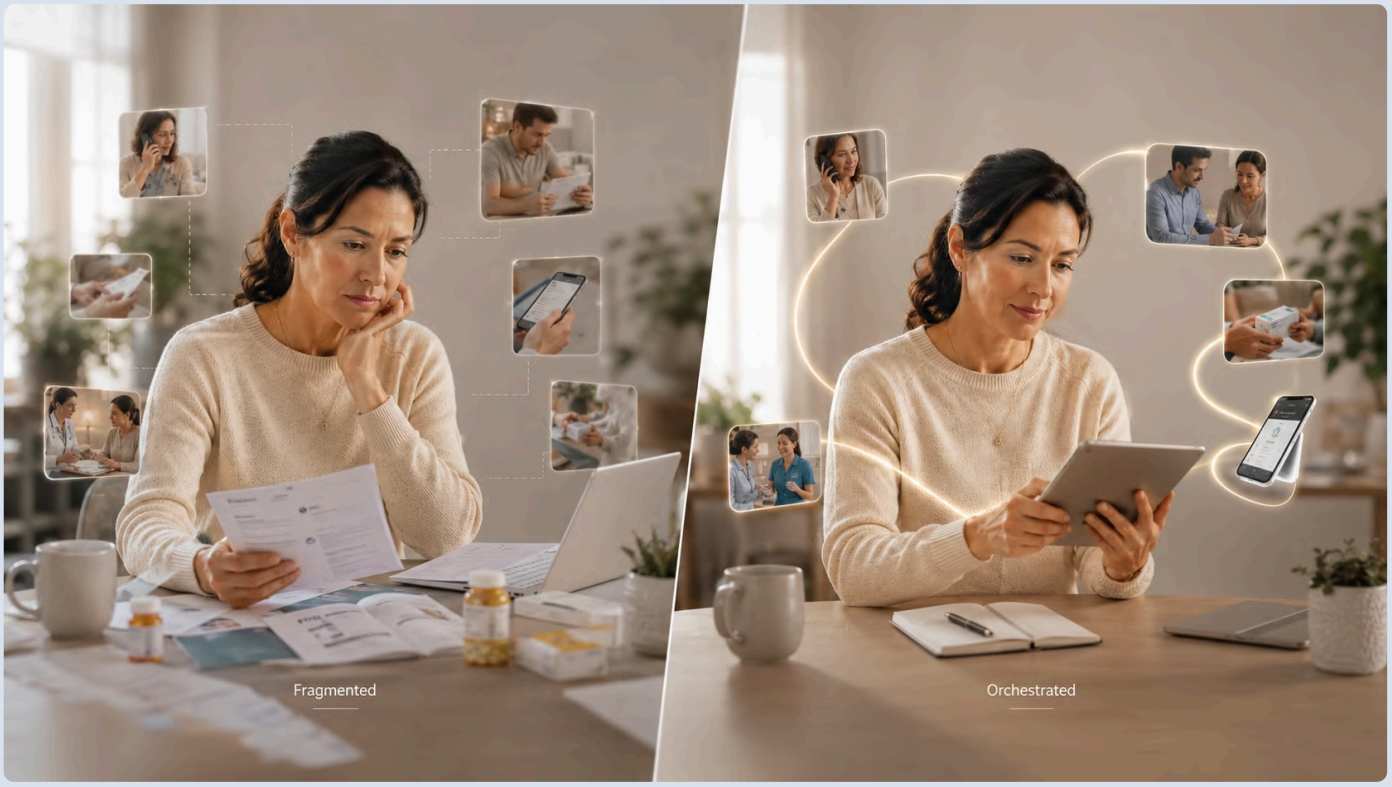
3

Governance

Organizations must maintain clear audit trails for AI-driven decisions, manage patient consent across channels and ensure engagement strategies align with HIPAA, GDPR, and privacy regulations.

Chapter 6: Orchestrating Connected Patient Journeys

Patients experience healthcare as a single journey. Unfortunately, many organizations still manage engagement through disconnected systems, channels, and teams. Marketing programs, patient support services, portals, mobile applications, and external partners often operate independently, creating fragmented experiences that diminish relevance.



The Fragmentation Problem

- Educational content that ignores recent support conversations
- Refill reminders arriving after a refill has already been completed
- Inconsistent messaging across channels and teams
- Patients repeating the same information across multiple touchpoints

The Orchestration Solution

- Personalized support informed by real-time patient context
- Consistent experiences across channels and touchpoints
- Timely interventions delivered when they matter most
- Coordinated engagement throughout the treatment journey

Chapter 7: Measuring Adherence Success

As adherence strategies become more sophisticated, organizations must ensure they are measuring outcomes that truly matter. Traditional engagement metrics such as open rates and click-through rates provide useful operational insights, but they offer only a partial view of success.

*The ultimate objective of adherence programs is not engagement activity, it is **sustained therapy participation and improved patient outcomes.***

Clinical Adherence Metrics

- Medication Possession Ratio
- Proportion of Days Covered (PDC)
- Therapy persistence rates
- Refill completion rates

Engagement Effectiveness

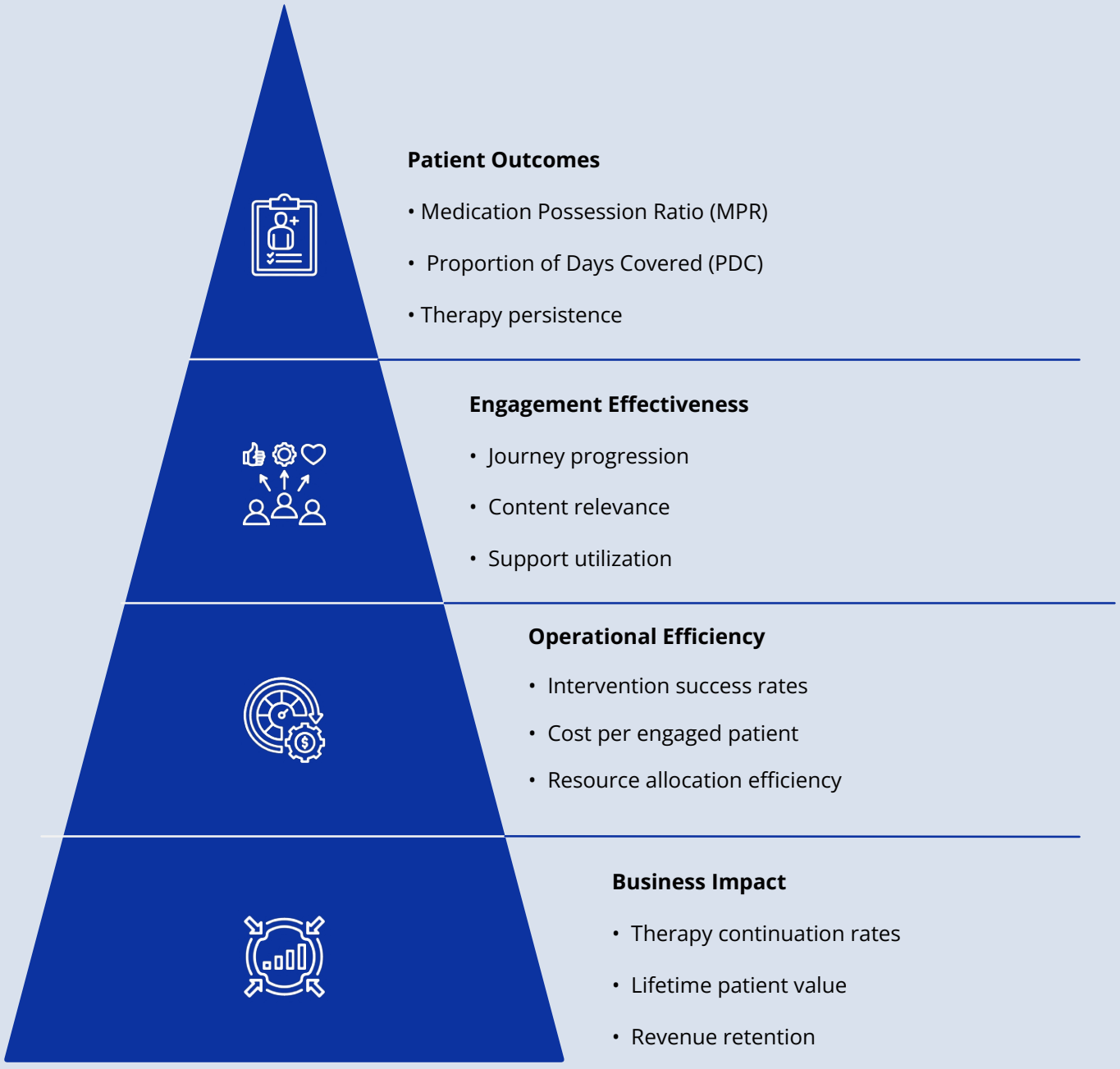
- Journey progression rates
- Content relevance scores
- Support program utilization
- Channel preference alignment

Intervention Performance

- Discontinuation risk reduction
- Confidence improvement rates
- Cost per engaged patient
- Resource allocation efficiency

The Four Dimensions of Adherence Success

Organizations that measure across all four dimensions gain a more complete understanding of program performance, connecting engagement activity to clinical outcomes and business impact. While individual metrics can highlight specific areas of success or concern, they often provide only a partial view of overall effectiveness.

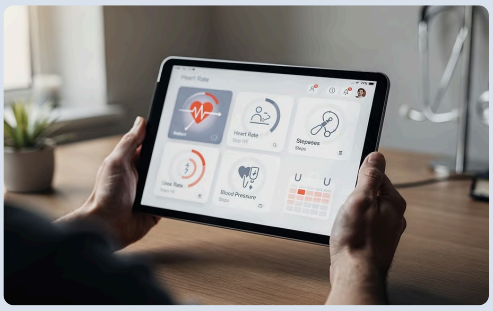


Each dimension provides valuable insight on its own, the greatest value comes from understanding how they influence one another. Improvements in engagement effectiveness can strengthen adherence outcomes, while operational efficiencies enable organizations to scale support effectively.

Chapter 8: The Future of Adherence Requires Intelligent Orchestration

Future adherence strategies will become increasingly predictive. Rather than responding after disengagement occurs, organizations will identify risks before they materialize. Behavioral signals, real-time data, and AI-driven insights will enable proactive interventions that help patients overcome challenges before they become barriers to treatment continuation.

Emerging Trends Shaping the Future of Adherence

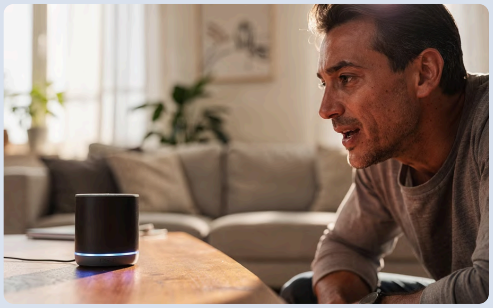


Digital Therapeutics

Increasingly complementing pharmaceutical treatments by providing behavioral interventions, disease education, and personalized support between clinical visits, reinforcing healthy behaviors and strengthening long-term adherence.

Connected Health Devices

Wearables, remote monitoring tools, and connected medical devices create new sources of real-time patient intelligence, providing visibility into treatment patterns and behavioral changes for earlier intervention.



Generative AI Assistants

AI-powered assistants can transform patient engagement by providing personalized educational support, answering treatment-related questions, and helping patients navigate challenges between healthcare interactions.

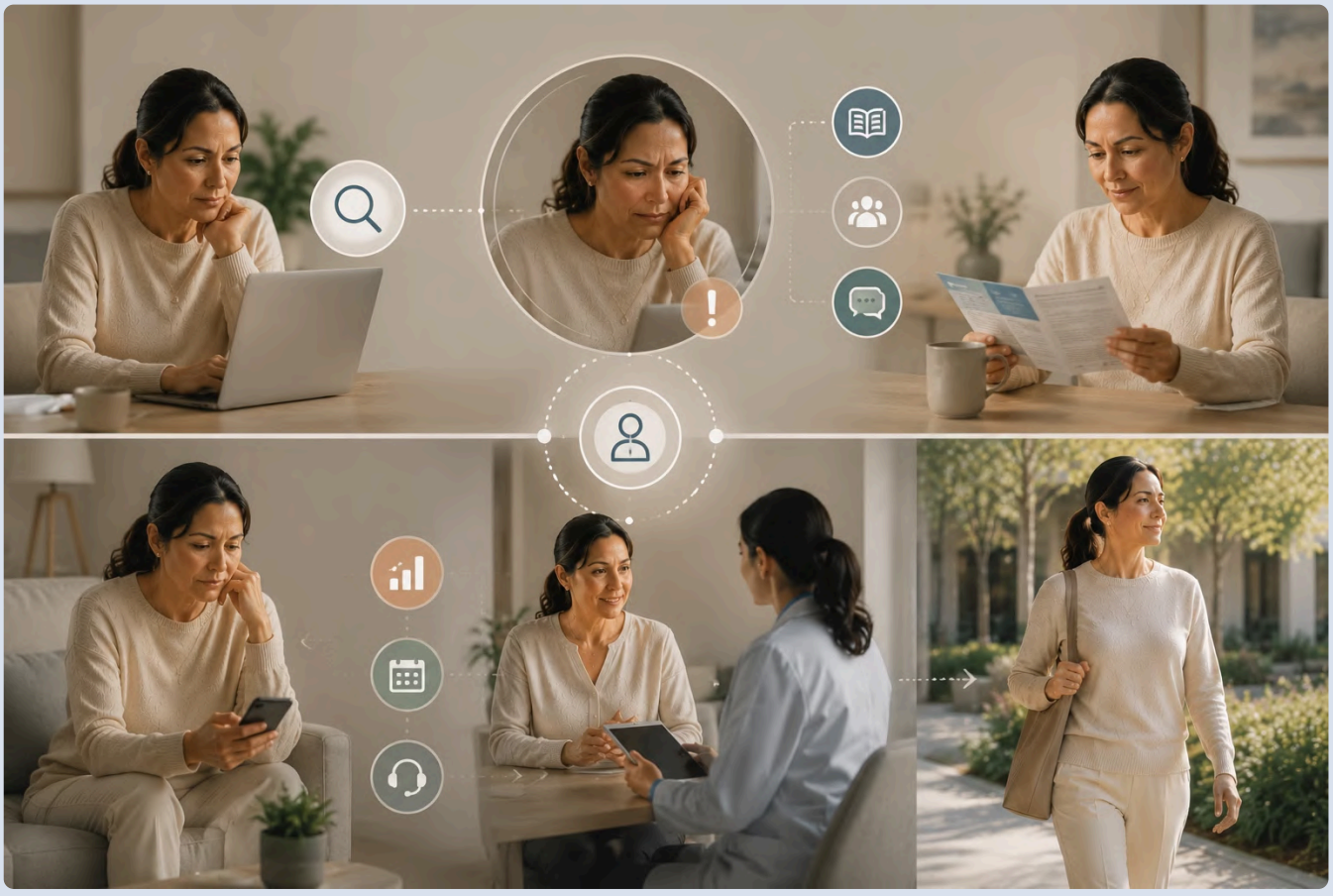
Predictive & Autonomous Orchestration

Future AI-driven platforms will continuously learn from patient behavior and dynamically adjust engagement strategies in real time, anticipating patient needs and creating more adaptive adherence journeys.

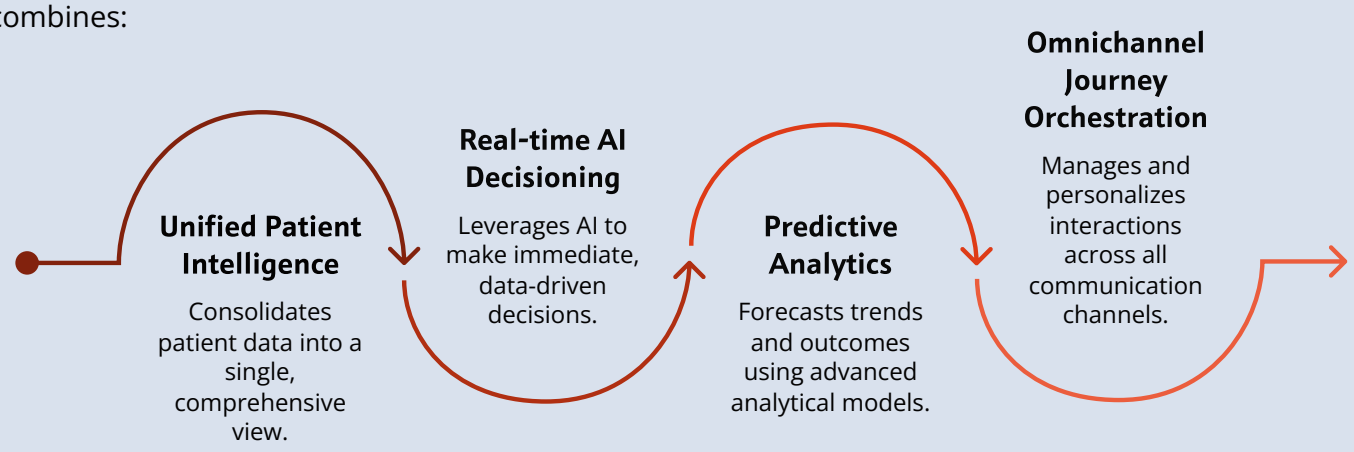
How Lemnisk Enables Real-Time Pharma Engagement

Real Impact

Imagine a patient who begins researching side effects shortly after initiating therapy. Traditional engagement systems may continue delivering scheduled onboarding content regardless of the patient's concerns. Similarly, when refill patterns, engagement activity, or support interactions suggest declining motivation, AI-powered next-best-action models determine the most appropriate intervention, channel, and timing to re-engage the patient.



Unlike traditional customer data platforms that focus primarily on audience management, Lemnisk combines:



Key Takeaways

*Medication adherence has long been treated as a **communication challenge.***

In reality, it is an experience challenge.

Patients remain engaged when they feel supported, understood, and confident throughout their treatment journey. Real-time personalization provides pharmaceutical organizations with the opportunity to deliver that support more effectively than ever before.

1

Move Beyond Reminders

Adherence improves when organizations address the reasons behind disengagement, not just the symptoms.

2

Treat Every Patient Journey as Dynamic

Static programs cannot keep pace with changing patient needs and behaviors.

3

Relevance Drives Better Outcomes

The most effective adherence programs focus on delivering the right support at the right moment rather than increasing communication volume.

4

AI Enables Intelligent Orchestration

By transforming patient signals into actionable intelligence, AI helps organizations anticipate needs, personalize support, and reduce disengagement risk.

5

The Future Belongs to Adaptive Engagement

Pharmaceutical organizations that combine patient intelligence, trust, and real-time orchestration will be best positioned to improve adherence and deliver better patient outcomes.

Conclusion

Medication adherence is not simply a communication challenge, it is an experience challenge. Patients remain engaged when they feel supported, understood, and confident throughout their treatment journey.

As patient needs evolve, organizations must move beyond static programs and disconnected interactions toward intelligent, real-time engagement. By combining patient intelligence, AI-driven decisioning, trust, and coordinated journey orchestration, pharmaceutical organizations can deliver more relevant support when it matters most.

The future of adherence belongs to organizations that can transform patient signals into meaningful action creating connected experiences that improve treatment continuity, strengthen patient confidence, and drive better outcomes.

Ready to Transform Patient Signals into Better Adherence Outcomes?

Discover how Lemnisk helps pharmaceutical organizations unify patient intelligence, predict adherence risks, and orchestrate personalized journeys in real time.

Get a Demo