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The Future of Medical Cost Management: Insights, Barriers, and Opportunities for Transformation

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Abstract: *The healthcare system is facing a period of unprecedented pressure, driven by a complex set of factors that affect payers, providers, members, and regulatory bodies alike. These challenges span a wide spectrum—from operational inefficiencies to increasingly complex clinical needs—and their scale continues to expand. As the industry navigates these shifts, it becomes essential to strike the right balance between cost, quality, and the overall member experience*

Keywords: future of medical cost management, insights, barriers, opportunities, transformation

INTRODUCTION

The healthcare system is facing a period of unprecedented pressure, driven by a complex set of factors that affect payers, providers, members, and regulatory bodies alike. These challenges span a wide spectrum—from operational inefficiencies to increasingly complex clinical needs—and their scale continues to expand.

Several macro forces are shaping this environment

- The landscape (aging population, chronic disease growth, inflation, labor shortages).
- Why is medical cost management critical inflection point?
- Importance of balancing **cost**, **quality**, and **member experience**.

As the industry navigates these shifts, it becomes essential to strike the right balance between cost, quality, and the overall member experience. How stakeholders respond to these challenges will determine how the healthcare system evolves—and who stands to benefit from the opportunities that emerge.

This independent whitepaper aims to provide a clear perspective on the key challenges, potential opportunities, and measurable benefits associated with modern medical cost management.

Challenges in Detail

As noted earlier, the pressures facing the healthcare system spare no stakeholder. Members, healthcare providers, payers, and regulatory bodies are all experiencing the effects of a rapidly evolving and increasingly complex environment. These challenges—financial, operational, and clinical—manifest differently across the ecosystem. The sections below provide a closer examination of the key issues from each stakeholder's perspective.

Provider Challenges

Increased Cost Factors

Healthcare providers continue to grapple with rising operational expenses that threaten the financial stability of clinical practices, hospitals, and health systems.

- **Labor Instability:** Persistent workforce shortages, high turnover, and increased reliance on contract or temporary staff have driven significant instability. Providers are struggling to maintain adequate staffing levels across critical roles.
- **Higher Compensation:** To attract and retain skilled clinicians and support staff, providers have been compelled to raise wages and benefits, further elevating overall cost structures.
- **Administrative Overheads:** Growing administrative requirements—documentation, compliance, reporting, quality programs, and billing processes—continue to consume both financial and human resources. These overhead costs divert time and attention away from direct patient care while contributing to rising provider expenses.

Patient Acuity

Provider organizations are also seeing a notable rise in patient acuity. More patients present with multiple chronic conditions, advanced disease progression, or complex comorbidities. This increased acuity places additional demands on clinical teams, drives up the use of high-cost services, and challenges the capacity of already strained care delivery systems.

Payer and Member Challenges

Sicker Population – Higher Risk

One of the most significant emerging challenges is the shifting risk composition of the insured population. Several economic and behavioral factors are influencing who remains covered and how costs are distributed.

Impact of Increased Risk Groups Driven by Higher Premiums: According to the U.S. Bureau of Labor Statistics [3], consumer prices increased by **3.0% between September 2024 and September 2025**, reflecting ongoing inflationary pressures. Health insurers are facing the same economic realities. A recent KFF report [4] indicates that premiums on the ACA Marketplaces are projected to rise by **26% on average in 2026**.

These cost increases place considerable strain on members, particularly those receiving health insurance through employer-sponsored plans. As premiums rise, healthier individuals—who tend to require fewer services—may choose to reduce their coverage or opt out entirely to manage household budgets.

Conversely, individuals with chronic conditions or ongoing medical needs have little flexibility and must continue their coverage despite higher costs. This creates a disproportionate concentration of higher-risk members in health plans, which further elevates the average risk score.

As the insured population becomes sicker and more dependent on healthcare services, payers are required to raise premiums even more to offset the growing risk—a cycle that can lead to increasingly unstable risk pools.

Evolution of Managed Care Organizations

Managed Care Organizations (MCOs) continue to evolve to address rising costs, shifting regulatory expectations, and the changing needs of members. However, this evolution is not without challenges. Expanding care management programs, integrating new technologies, and adopting value-based care arrangements require substantial investment. MCOs must balance innovation with financial sustainability, all while navigating complex provider relationships and member needs.

Federal and State Funded Programs

Recent policy changes related to benefit and coverage redetermination have created additional uncertainty for federal and state-funded programs. Regulatory bodies responsible for overseeing

care quality and funding allocations have revisited subsidy levels and overall financial support for these programs.

Historically, many payers were able to reduce premiums through targeted subsidies and government-backed initiatives. As funding landscapes shift, payers face increased pressure to absorb costs previously offset by these programs—further contributing to premium increases and financial strain across the ecosystem.

Additional Factors to Consider

Beyond the direct drivers of rising medical costs, several emerging and environmental factors are reshaping the broader cost-of-care landscape. These include rapid technological advancements, evolving member behavior in the post-COVID era, increasing social and demographic pressures, and persistent fragmentation in data and interoperability across the healthcare ecosystem. Together, these elements create additional complexity that must be considered in any comprehensive view of medical cost management.

Introduction of AI for Enhanced Documentation

The arrival of Artificial Intelligence (AI) and, more recently, Generative AI has prompted an industry-wide push to identify high-value applications capable of improving efficiency and accuracy across clinical and administrative workflows. These technologies are being used in a wide range of scenarios—from basic digital chat support to assisting with highly complex medical policy evaluations.

One notable example is the emergence of ambient documentation solutions that convert provider–patient conversations into structured clinical notes. These tools support clinicians by reducing the administrative burden of medical documentation and ensuring that standard coding requirements are met more consistently.

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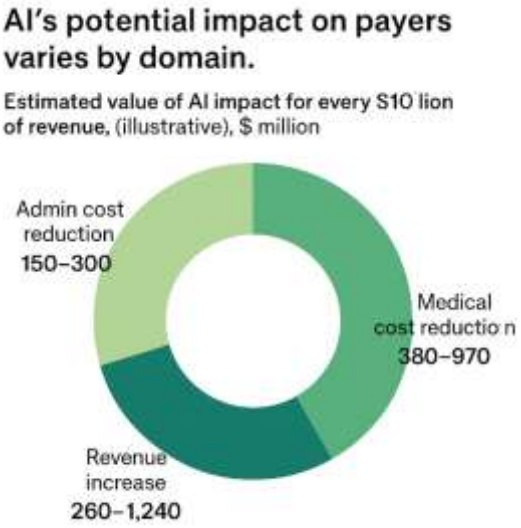

Chart 1. AI's potential impact on Payers. Curtesy – McKensy & Company [1]

A practical illustration of how AI can influence care management comes from the prior authorization process:

Common Reasons for Prior Authorization Failures

Approximately **90% of prior authorization failures** stem from three major categories:

- **Input Errors (40%)** – Missing or invalid information, such as incorrect member ID or CPT code.
  Example: A provider mistypes a member ID or omits a required diagnosis code, leading to an automatic rejection.
- **Routing Failures (29%)** – Submissions sent to an incorrect payer or product line.
  Example: A request intended for a commercial health plan is mistakenly routed to a Medicaid plan, preventing proper processing.
- **Duplicate Denials (19%)** – Repeat submissions for requests already in progress.
  Example: A provider, not receiving an immediate confirmation, resubmits the same request, which is then flagged and denied as a duplicate.
- **Other Data Mismatches (≈11%)** – Issues such as DOB inconsistencies, NPI or taxonomy misalignment, and coverage validation errors.
  Example: A birthdate mismatch or incomplete provider identification details causes the system to hold or reject the request until corrected.

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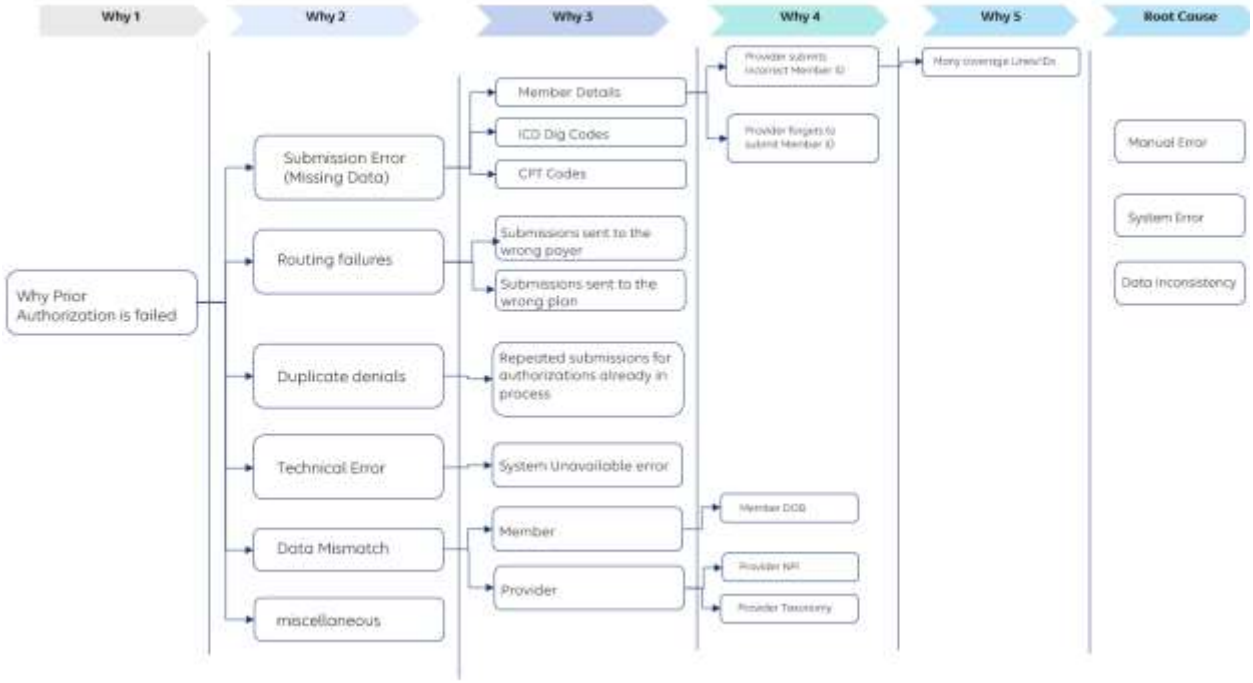

Figure 1 would provide an illustrative "Five Whys" analysis demonstrating the root causes for prior authorization failures.

Generative AI can significantly reduce these avoidable errors by validating, standardizing, and completing necessary data elements before submission. As accuracy improves, approval rates rise—and with higher approval rates comes increased utilization, ultimately contributing to increased medical cost.

AI in the Appeals Process

Another area where Generative AI offers substantial impact is in the appeals process. Historically, appeals—whether for prior authorization denials due to lack of medical necessity or claims denied because of incomplete clinical documentation—have been labor-intensive and complex. Preparing a robust appeal requires deep review of member benefit documents, provider agreements, medical policies, and the member's clinical history [2].

With the adoption of Generative AI and Large Language Models (LLMs), these disparate documents can be synthesized and interpreted together to craft more comprehensive and evidence-supported appeals. As a result, appeal submissions have become stronger and more difficult for payers to uphold based solely on documentation gaps. Consequently, a larger share

of appeals is being overturned, leading to more claims being paid again contributing to increased utilization and rising overall costs.

Some of the **AI techniques** that can power the prior-authorization (PA) GenAI use cases are:

Natural Language Processing (NLP) for Clinical Data Extraction

Clinical NLP enables automated extraction of structured data from unstructured clinical notes, orders, and referrals used in prior authorization workflows. Using techniques such as named entity recognition and medical coding normalization, NLP identifies diagnoses, procedures, symptoms, and supporting evidence and maps them to standardized terminologies like ICD-10 and CPT. This reduces manual data entry errors, improves documentation completeness, and ensures clinical intent is accurately captured for payer review.

Technologies:

- Clinical NLP
- Named Entity Recognition (NER)

- Relation Extraction

Large Language Models (LLMs) for Documentation & Reasoning

Large Language Models are used to generate high-quality medical necessity narratives, payer-specific explanations, and appeal documentation by synthesizing clinical data and coverage requirements. When guided by structured prompts and domain constraints, LLMs can reason over patient context and payer policies to produce consistent, policy-aligned documentation. This improves first-pass approval rates while reducing provider and utilization management workload.

Technologies:

- Generative LLMs
- Instruction-tuned models
- Domain-adapted healthcare LLMs

Embedding Models for Similarity & Deduplication

Embedding models convert prior authorization requests, denial reasons, and appeal narratives into semantic vector representations. These vectors enable similarity detection across historical cases, allowing systems to identify duplicate or near-duplicate submissions even when wording differs. This capability helps prevent repeat denials, surfaces previously successful remediation strategies, and reduces unnecessary resubmissions.

Technologies:

- Text embeddings
- Vector databases

Machine Learning (ML) for Predictive Denial Risk

Supervised machine learning models analyze historical prior authorization outcomes to predict the likelihood and cause of denial for new requests. These models evaluate factors such as documentation completeness, procedure type, payer behavior, and provider history. By providing early risk scores and explanations, ML enables proactive correction of high-risk requests before submission.

Technologies:

- Supervised ML
- Explainable AI (XAI)

Data Reconciliation & Mismatch Detection AI

Entity resolution and fuzzy-matching algorithms reconcile patient, provider, and plan data across EHRs, PA platforms, and payer systems. These models identify mismatches such as incorrect member IDs, provider credential inconsistencies, or facility errors and recommend corrective actions. This capability reduces administrative denials and downstream claim rejections caused by data inconsistencies.

Technologies:

- Entity resolution
- Fuzzy matching
- Probabilistic reasoning

Retrieval-Augmented Generation (RAG)

Retrieval-Augmented Generation combines search capabilities with generative AI to ground LLM outputs in authoritative sources such as payer policies, CMS guidelines, and internal utilization rules. By retrieving relevant policy content at generation time, RAG reduces hallucinations and ensures documentation is accurate, compliant, and auditable. This is critical for regulated healthcare workflows like prior authorization.

Technologies:

- RAG architectures
- Search + LLM pipelines

Social Determinants of Health (SDoH)

Non-clinical factors continue to play a substantial role in shaping medical costs and health outcomes. SDoH—including housing stability, food security, transportation access, financial strain, and environmental conditions—can significantly influence an individual's ability to access and adhere to necessary care. These external pressures often manifest as delayed treatment, unmanaged chronic conditions, or reliance on higher-cost settings such as emergency departments.

Inequities across different populations further contribute to avoidable downstream expenditures, as groups experiencing greater socioeconomic barriers tend to face higher disease burden, increased complications, and more acute utilization. Addressing SDoH is therefore not only a

matter of improving care quality and equity but also an essential lever for long-term cost management.

Behavioral Health Crisis & Integration Needs

The healthcare system continues to face a persistent behavioral health crisis characterized by increasing rates of anxiety, depression, substance use disorders, and other mental health conditions. These issues are often underdiagnosed or inadequately treated due to limited access to behavioral health specialists, long wait times, and stigma that discourages care-seeking.
When behavioral health needs go unaddressed, members are more likely to experience exacerbations of coexisting medical conditions, leading to higher emergency department visits, inpatient admissions, and overall acute utilization. Integrating behavioral health more effectively into primary and specialty care settings is therefore critical—not only to improve outcomes but also to mitigate avoidable medical cost escalation.

Member Engagement & Benefit Design Complexity

Member engagement plays a pivotal role in effective medical cost management. However, low engagement—particularly in digital channels—can result in missed opportunities to guide members toward lower-cost, high-value care options. For example, limited adoption of digital navigation tools reduces the likelihood that members will choose telehealth, urgent care, or alternative sites of service when appropriate.
Additionally, benefit designs have grown more complex, and many members struggle to fully understand their coverage, care pathways, or cost-sharing obligations. This lack of plan literacy often leads to inappropriate utilization, such as using emergency services for non-emergent needs or bypassing preventive care. Improving member understanding and participation is therefore essential to driving more efficient and cost-effective care decisions.

Data Fragmentation & Interoperability Gaps

Fragmented data across payers, providers, pharmacies, labs, and ancillary services continues to limit the industry's ability to form a complete, accurate view of a member's health status. When clinical and administrative data remain siloed, risk identification becomes less precise, hindering proactive interventions that could reduce medical cost.
Interoperability gaps also impede care coordination by preventing seamless information exchange among care teams. This fragmentation contributes to redundant testing, delayed diagnoses, medication conflicts, and other inefficiencies that ultimately drive avoidable costs. Strengthening data connectivity and standardization is therefore a foundational requirement for achieving meaningful, systemwide cost management.

Opportunities

As the healthcare system navigates increasing complexity and cost pressures, several strategic opportunities have emerged that can significantly improve efficiency, reduce administrative burden, enhance member experience, and ultimately contribute to better cost management. The following areas highlight pathways for meaningful transformation across the industry.

Administrative Savings Through Technology Enablement

While the rapid success of Artificial Intelligence (AI) and Generative AI has been widely discussed, it is important to recognize that these technologies address long-standing inefficiencies across healthcare administration. A substantial portion of manual errors, processing delays, and workflow inconsistencies can be minimized—or eliminated entirely—through targeted automation and intelligent augmentation.

Organizations that fail to modernize their business processes risk creating operational bottlenecks, increased rework, and unnecessary administrative overhead. Leveraging technology not only improves productivity but also strengthens data quality, reduces turnaround times, and enhances compliance.

Innovations such as precision drug matching, automated benefit administration, AI-supported clinical reviews, and ambient physician documentation represent significant breakthroughs. These tools not only eliminate inefficiencies but also improve patient experience, reduce costs, and enable more real-time decision-making capabilities.

Digital Connectivity and End-to-End Process Simplification

Strengthening digital connectivity across the healthcare ecosystem presents another critical opportunity. Many existing gaps—submission fallouts, incomplete data exchanges, inconsistent processes—can be addressed by implementing standardized, streamlined digital workflows across key operational domains, including enrollment, benefits validation, claims submission, and prior authorization.

Current Electronic Data Interchange (EDI) standards, while foundational, are no longer sufficient to meet the growing demands of real-time interoperability. Transitioning toward modern data-exchange methods such as FHIR-based interfaces, enhanced Electronic Medical Records (EMR) integration, and advanced interoperability frameworks is essential.

Improved end-to-end connectivity supports automated decisioning, intelligent routing, and real-time prior authorization submissions, ensuring that members receive appropriate care at the right

time and at the optimal cost. This foundational digital transformation accelerates the shift toward a more responsive, efficient, and data-driven healthcare system.

Network Optimization

Optimizing provider networks offers a strong opportunity to influence total cost of care while preserving quality and access.

- **High-Value Network Design:** Developing networks that prioritize cost-effective, high-quality providers can steer members toward care settings that deliver superior outcomes at lower cost.
- **Steerage Programs and Virtual-First Care:** Programs that encourage members to choose optimal sites of service—such as outpatient facilities, urgent care, or telehealth—can materially reduce unnecessary spending. Virtual-first models, in particular, can expand access while avoiding more costly in-person visits when clinically appropriate.

A well-structured network strategy supports both affordability and clinical effectiveness, benefiting members and payers alike.

Fraud, Waste, and Abuse (FWA) Prevention

Strengthening FWA programs remains essential for controlling avoidable costs within the healthcare system. Modern AI capabilities significantly enhance the ability to detect aberrant patterns in billing, utilization, and provider behavior.

- **Advanced Detection:** Machine learning models can identify anomalies that traditional rules-based systems may overlook, enabling earlier intervention and reducing inappropriate payments.
- **Retrospective vs. Prospective Integrity:** While retrospective reviews identify issues after claims are paid, prospective integrity solutions prevent erroneous or fraudulent claims from processing in the first place. Shifting toward real-time or near-real-time detection provides substantial savings and reduces administrative burden.

By combining advanced analytics with targeted operational controls, organizations can meaningfully reduce the financial impact of fraud, waste, and abuse across the system

Benefits and Success Measures

As organizations modernize their medical cost management strategies, the resulting benefits can be measured across financial performance, care quality, operational efficiency, and stakeholder

experience. A structured benefits framework ensures that initiatives not only generate measurable impact but also support long-term sustainability across the healthcare ecosystem.

Reduction in Total Cost of Care (TCOC)

A primary goal of cost management programs is to slow the rate of medical cost growth and reduce Total Cost of Care (TCOC). Unlike short-term cost containment efforts, modern solutions emphasize proactive identification of avoidable utilization, improved care coordination, and strategic network alignment.
Effective programs can demonstrably reduce high-cost episodes such as inpatient admissions, out-of-network spend, and unnecessary specialty or diagnostic services.

Per Member Per Month (PMPM) Savings

PMPM trends remain one of the most widely used measures for assessing cost management performance. Improvements in administrative efficiency, utilization management accuracy, fraud prevention, digital connectivity, and network steerage directly influence PMPM outcomes.
For payers and employers, sustained PMPM reductions translate into greater affordability and enhanced plan competitiveness.

Quality and Clinical Outcome Improvements

Cost management strategies also contribute to improved clinical outcomes when implemented thoughtfully:

- **Reduction in avoidable admissions and readmissions**
- **Lower emergency department (ED) utilization for non-emergent issues**
- **Increased adherence to evidence-based guidelines**
- **Improved chronic condition management through better data sharing and engagement**

These quality improvements help mitigate long-term expenditures and support value-based care models.

Operational Efficiency and Provider Burden Reduction

Digital automation, streamlined prior authorization, enhanced documentation, and interoperability initiatives significantly reduce administrative friction.
For providers, decreased manual work leads to:

- More clinically productive time
- Fewer rework cycles
- Lower denial rates
- Improved payment accuracy and speed

This contributes to greater provider satisfaction and strengthens payer–provider relationships.

Member Experience and Engagement Gains

Member satisfaction is increasingly viewed as a core indicator of program success. Enhanced digital navigation tools, simplified benefit designs, and faster authorization decisions reduce confusion and delays in accessing care.
Improvements can be tracked through:

- CAHPS scores
- Net Promoter Score (NPS)
- Member complaint and grievance rates
- Digital channel utilization metrics

Better engagement drives more appropriate, cost-effective utilization patterns while supporting improved health outcomes.

Return on Investment (ROI) and Program Sustainability

Measuring ROI across cost management initiatives ensures that investments in technology, staffing, and infrastructure deliver proportional impact.
ROI models typically evaluate:

- Direct medical savings
- Administrative savings from automation
- Reduced FWA losses
- Impact on TCOC and PMPM
- Program cost versus benefit realization timeline

A comprehensive ROI framework enables organizations to prioritize initiatives that yield the greatest value and scale them effectively.

CONCLUSION

The healthcare ecosystem stands at an inflection point where rising medical costs, shifting population risk, administrative complexity, and evolving member expectations converge to create unprecedented challenges. Successfully navigating this environment requires a shift from reactive cost containment to **proactive, data-driven, and technology-enabled medical cost management**.

AI and digital infrastructure are no longer optional—they are foundational enablers that can transform how data is exchanged, how decisions are made, and how stakeholders interact across the system. When paired with modernized benefit design, optimized networks, and targeted interventions addressing behavioral health and social determinants, these capabilities support a more resilient and equitable healthcare model.

Achieving sustainable affordability requires maintaining a balanced focus on:

- **Cost** – managing rising expenditures while ensuring appropriate utilization
- **Quality** – promoting evidence-based, coordinated, high-value care
- **Access** – ensuring timely and equitable care across all populations
- **Experience** – minimizing administrative burden and improving member and provider satisfaction

Healthcare organizations that embrace this integrated approach will be best positioned to improve financial performance, strengthen outcomes, and deliver a more seamless experience for all stakeholders.

Ultimately, the transformation of medical cost management is not merely about lowering expenses—it is about redesigning the healthcare system to function more efficiently, equitably, and predictively. The opportunities outlined in this paper underscore the potential for meaningful and lasting change, provided the industry invests in the right capabilities and collaborates across traditional boundaries.

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