



AUTOMATION AND CARE ORCHESTRATION:

**The Key to Addressing Today's Workforce Burden
While Improving Patient Journeys and Outcomes**

INTRODUCTION

Healthcare in the US is currently facing major challenges stemming from workforce issues that pre-date (but have been compounded by) COVID-19, financial and operational issues amplified by the pandemic, and enduring systemic issues such as silos in data and technologies. Addressing these challenges will require deeper digital re-engineering that connects process and data silos with key team members in ways that can improve outcomes, ameliorate worker burnout, and improve the patient journey.

Chilmark Research has been exploring how automation through care orchestration, robotic process automation

(RPA), and artificial intelligence (AI) can play a role in improving outcomes, lowering costs, and improving the working conditions for both clinical and administrative workers. In this white paper, we examine the contribution of automation-driven care orchestration.

According to a 2019 study in JAMA, 30% of US healthcare spending can be considered wasted spending. The study found that failures in care delivery accounted for \$102.4 billion to \$165.7 billion and that the failure of care coordination accounts for \$27.2 billion to \$78.2 billion of the wasteful spending or at least 17% of total waste.

Cost of Healthcare Waste

A new study led by Dr. William Shrank of Humana estimates that the U.S healthcare system wastes up to \$935 billion annually

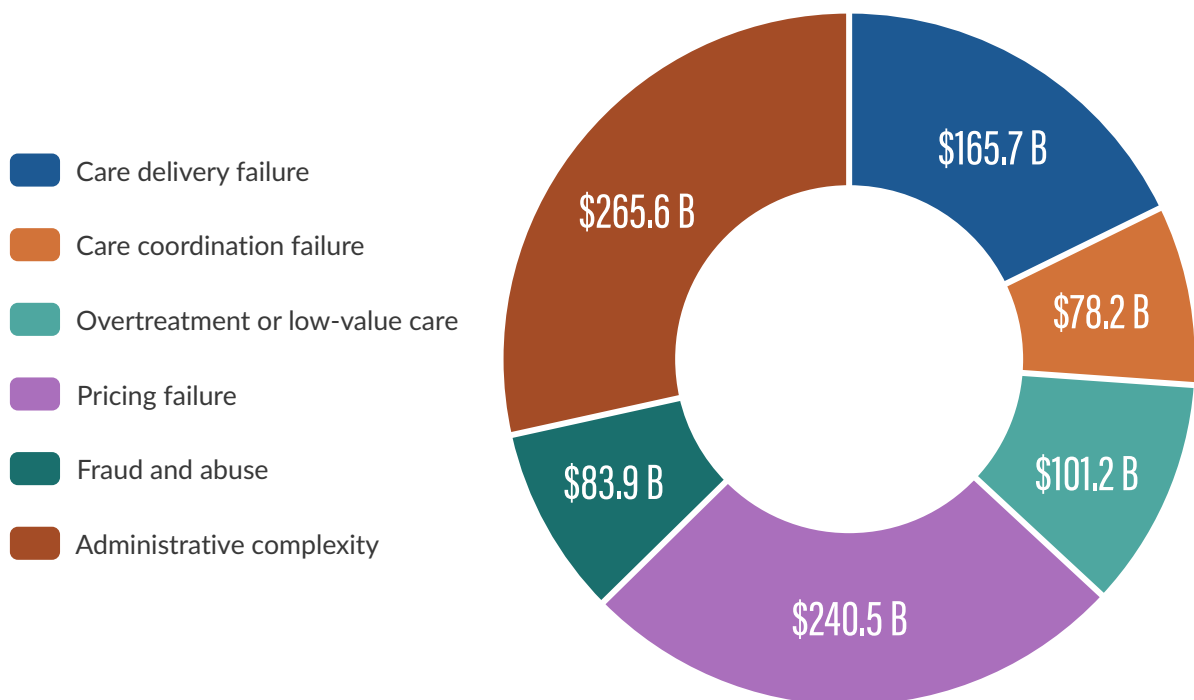


Figure 1.
Breakdown of Healthcare Waste
(Source: JAMA)



US healthcare workers and health systems are also being challenged by a workforce shortage, excessive administrative burdens, and the financial pressures stemming from the COVID-19 pandemic. These challenges are putting enormous strain on healthcare organizations (HCOs). Today there is a pressing need for solutions that will simultaneously improve clinical workflows while addressing clinician burnout, as well as help contain costs and improve patient outcomes. The advent of new technologies to eliminate redundant administrative tasks and improve clinical processes holds the promise of addressing many of these

challenges. These tools are also critical to overall digital transformation strategies of health systems.

A recent study in JAMA (conducted by McKinsey) examined the administrative burden of the \$3.8 trillion spend on healthcare. It reported that some \$950 billion is spent on non-clinical, administrative functions and determined that over \$250 billion could be saved by simplifying administrative processes.¹ Approximately \$175 billion of the savings can potentially be realized from three core transactional processes within organizations.

Type of known intervention	Example interventions	Savings, \$billion	Administrative spending, %
"Within" Interventions that can be controlled and implemented by individual organizations	› Financial transactions ecosystem (claims processing): Streamline claims submission process through simplified provider platforms; clarify Explanation of Benefits	\$175	18
	› Industry-agnostic corporate functions: Automate repetitive work in human resources and finance; build functions of the future leveraging new technologies, such as analytics and cloud computing		
	› Administrative clinical support functions: Remove work for nursing managers through automated manual tools for scheduling and staffing; integrate suite of tools and solutions to communicate 360-degree view of patients to case managers		

Figure 2.
Potential administrative savings by function within organizations
(Source: McKinsey)

1 Sahni, N. et al. Administrative Simplification and the Potential to Save a Quarter-trillion Dollars in Healthcare. JAMA, October 20, 2022. [Link to JAMA article.](#)

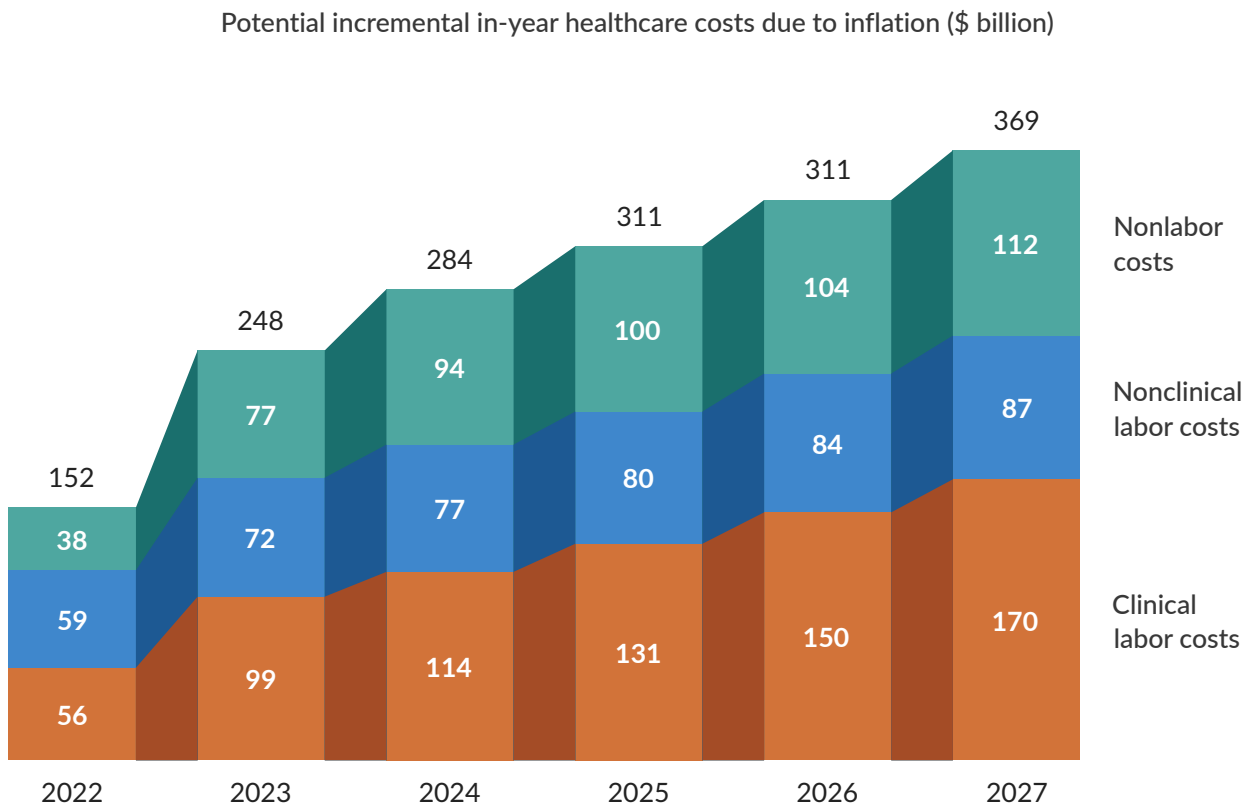
Healthcare has a notorious reputation for fragmented or siloed systems (both data and technologies) and organizations that lead to inefficiencies in care, frustrated patients and providers, and poor outcomes. CAQH estimates that health plans and providers could save nearly \$25 billion annually by automating some of the most important administrative functions.

A recent report from the US Surgeon General highlights the factors causing burnout and the overall impact on patients and access to care. A leading factor is the ever-growing administrative burden that clinicians are faced with. The

administrative burden creates a disconnect between the mission of medicine that attracts professionals to the field and the actual practice of clinical medicine, according to the report.

The shortage of clinicians in the country is also exacerbating the cost of care (see Figure 3) leading to above average inflation cost increases that show no signs of abating. These conditions will persist for the foreseeable future as the baby boomers, born between 1946 and 1964, reach retirement and require more medical interventions.

The largest portion of potential extra healthcare cost are introduced to the system in 2022-23



Inflation and clinical labor wage growth are significantly above baseline trends in 2022 and 2023 before returning to a lower rate of growth on this elevated baseline.

Figure 3. Drivers of Healthcare Costs (inflation) 2022-23
(Source: McKinsey)



AUTOMATION: WHY NOW?

Automating administrative and some clinical processes in the past has been difficult, due mainly to the lack of interoperability across electronic health records (EHRs), which limited the ability to share data across platforms within an enterprise. Over the past decade the growth in adoption of standards—such as HL7 FHIR and APIs—is improving interoperability and our ability to exchange data with systems that can perform value add services such as automation.

Data exchange with companion systems to the EHR enables greater functionality and coordination of clinicians, social workers, and others responsible for providing the overall care for patients. Critical to care coordination and orchestration is the ability to get the right contextual data to the right personnel at the right time to prevent patients from “falling between the cracks” and experiencing unnecessary complications or over-utilization of emergency departments (EDs). Interoperability has been a challenge that has hampered health systems’ ability to provide proper care coordination in the past; this has begun to change.

The 21st Century Cures Act created the regulatory push for payers to adopt APIs for data exchange with providers in their networks. More recently the Trusted Exchange Framework and Common Agreement (TEFCA) provided further impetus to improve interoperability and data exchange across different EHR platforms through greater adoption of APIs.

A great deal of the discussion on automation focuses on robotic process automation (RPA) for automating tasks. However, these tools are more appropriate in contexts where the use cases are highly standardized simple ‘silo’ use cases usually with fixed inputs and outputs of trusted data. Many of the tasks that can be readily automated are rules-based and can be automated without the use of AI/ML, carrying fewer risks than AI enabled tools. Non-AI automation tools can also be easier to implement and may have a number of other advantages such as built-in governance, with every action being explainable and traceable back to a protocol or decision rather than a probability.



CARE ORCHESTRATION: WHAT IS IT?

While RPA has been proven to be successful in areas such as revenue cycle or intake processes, clinical workflows have proven more challenging due to the lack of reliable and trustworthy data on which to act. This lack of trust is typically mitigated through rework and revalidation performed by highly licensed care team members who find themselves ‘coordinating’ the care of patients through careful step by step planning and verification. It is here that a different approach is needed.

The coordination of care has historically been a time consuming, manual and inefficient process involving clinicians and non-clinical staff. While the system of record has proven effective as a documentation and billing system, the actions and processes around these clinical activities are not typically documented in the same way so have not traditionally been easily open to automation, despite the obvious benefit it might bring.

The effective coordination of care requires that the patient, clinicians and extended care team members are on the same page, with access to data that is as real-time as possible – across orders, updates to care treatment plans, and clinical decisions.

This is a process that, when done well, is personalized to the needs of the patient and the clinical workflows around them; ‘one size fits all’ approaches do not work, but the process also needs to work at significant scale.

As a result, what is required is an approach that combines the need for personalization with the efficiencies of automation.

Care orchestration is the coordination of the data and actions across multiple systems enabling the people using that data to better coordinate care.

Despite acting as the system of record, provider-owned EHRs are often poorly equipped to provide care orchestration alone. This is due to the fact that patients’ records may be distributed across multiple external providers and, as a result, any one system may carry an incomplete or inaccurate view of the data. These gaps are a source of inefficiency and are usually mitigated by clinical teams through continuous revalidation of the data with the

patient and/or reordering of potentially known tests, another source of inefficiency and cost.

Automated care orchestration takes advantage of the greater access to data; combining care protocols with augmented data from external sources (including the patient); to increase the capacity of clinical teams, achieve better outcomes at scale, improve the patient experience, as well as lower the cost of care. It aims to ensure that the right care is provided to the right patient at the right time – every time.

This ability to provide an augmented record and combine it with evidence-based protocols serves an additional function: enhanced clinical safety. Care orchestration ensures compliance with the right care protocol for the right patient while also ensuring consistency of decisioning and follow up. This safely reduces the work required for low-risk patients and increases the focus on higher-risk patients, enhancing the capacity of the clinical workforce and care management teams ensuring that they are always operating at top of license.

OVERVIEW OF THE LUMEON ORCHESTRATION PLATFORM

Lumeon is one example of a mature care orchestration solution for automating workflows to improve the patient journey, reduce the work burden of health workers, and improve outcomes.

The Lumeon care orchestration platform's orchestration engine has four main components:

- › Interoperability: the interoperability broker gathers real-time data from various sources to understand the context for decision making processes, visualizes the data and helps to make better and quicker decisions for each patient.
- › Configurable workflows and decisioning: the engine is configurable with the existing technology an organization has and works to automate care management processes that are currently manually completed. Once the clinical processes are understood, the orchestration engine then works in real-time to optimize workflows and creates an orchestration plan that runs in the background to standardize processes across the care team consistently.
- › Timed, loop-closing functionality: the engine knows the outcomes for every step based on the "orchestration plan" and can check to ensure that each step is completed. If a patient or care team member has not completed a step the engine will make sure a workflow task, text message or call is made, if they need to take action, to remind them to complete a task or step, or an action is escalated to the care team member.
- › Digital tools to automate manual activities: For those activities that result in another action being recorded in the EHR, or where there is processing to be performed on known data, automation and clinical decisioning rules can be utilized to remove manual, repetitive processes that don't need clinical judgment. This comprises a surprising number of clinical tasks and is a major driver of increased efficiency.

The Lumeon care orchestration engine is not a predictive model or other form of clinical decision support. Rather, the platform is informed of the latest documented pathway for a patient so that all decisions made by the engine are understood by the clinical team.

It uses existing best practice standardized protocols for treatment pathways but can dynamically respond to changes in data, including treatment plans, and provide more efficient approaches when necessary. The orchestration engine utilizes a feedback loop that integrates with existing technologies, curates best practices, identifies process improvements, and measures impact for insights on improvements (Figure 4 below).



Figure 4. Lumeon's care orchestration process

CASE STUDIES OF AUTOMATION AND CARE ORCHESTRATION

Provided below are some example case studies that demonstrate the return on investment (ROI) of the Lumeon Care Orchestration platform in two distinct practice areas. These case studies highlight the impact on clinical workforce capacity and improvement of the patient journey.

Ophthalmology Case Study

In the UK, glaucoma accounts for 14% of the cases of blindness or approximately 500,000 people diagnosed, with another 500,000 suspected cases. The most important challenge is screening people early enough to prevent degeneration in sight; this is complicated by the fact that it typically takes four separate appointments lasting approximately one hour each. The hospitals of the National Health Service (NHS) have been at full capacity; the best screening approach was to bring care into the community via mobile diagnostic screening.

A major healthcare provider working with the NHS engaged with Lumeon to manage workflows and coordinate processes between patients, administrators, optometrists, and off-site ophthalmologists. An innovative pathway for the entire clinical journey from appointments to testing, monitoring and recall was operationalized on the Lumeon care orchestration platform. This also changed the standard model by empowering optometrists to perform tasks traditionally done by ophthalmologists, while ensuring

that these decisions were safety-netted with a novel virtual review process, performed by experienced ophthalmologists. Risk assessments were used to assign patients to personalized pathways, with the highest-risk patients assigned to intensive condition monitoring pathways with regular follow-up.

The Lumeon approach led to more real-time information being made available for each user, and the automation of administrative and clinical workflows that enabled more regular screening and expedited care. Applying the methodology also enabled consistent comparison of service levels, clinical outcomes and effectiveness to provide better care.

Patient time spent in the clinic was reduced from 3-4 hours in the conventional clinic to only 45-60 minutes with use of the Lumeon platform reducing total cost of care by over 60%. Instead of physicians spending time completing low-value tasks plus in-clinic visits averaging 20 minutes per patient, they can now conduct virtual consultations that take approximately 3 minutes per decision and are able to spend longer with the more complex cases. Backlogs of patients awaiting monitoring appointments were reduced by 50% which resulted in improved customer service and improved access to treatment, as well as better reporting on patients from clinicians. This was all accomplished with minimal service disruption and within efficient implementation times.

Transforming Pre-Operative Care

Thorough preoperative care is critical to improved outcomes, as well as managing clinical workflows and staff work burden. Preoperative care often requires substantial human resources and time, so this became a promising intervention area for the Lumeon care orchestration platform. In this case study, we look at how Lumeon approached this challenge with a US integrated delivery network (IDN) and their surgical line to address the following goals:

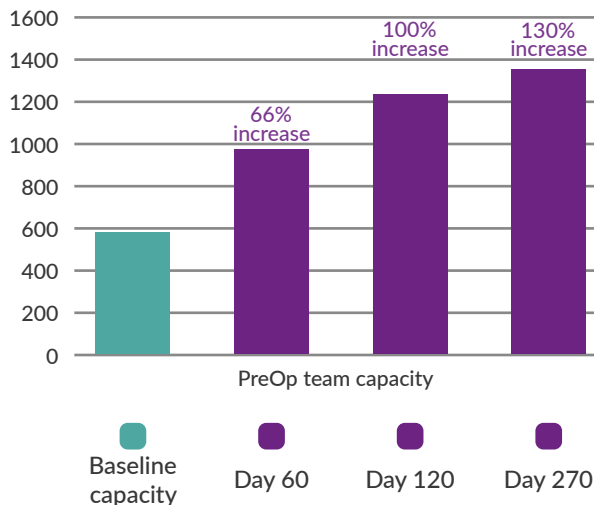
- › Minimize the number of unnecessary in-person visits and tests
- › Optimize capacity of preoperative teams
- › Enhance control and visibility of patient journeys
- › Maintain digital touchpoints with patients to ensure they stay on track
- › Reduce unnecessary tests that cause bottlenecks in workflows and the patient experience throughout the care journey

Lumeon approached the challenges by working with the client to embed the in-house protocols into a digital care journey using the Lumeon orchestration engine. The legacy manual process was transformed into an automated process and Lumeon identified process improvements as well.

The impact of automating the preoperative care process was profound. At least 70% of the patients could be managed virtually, without a site visit, and through either digital touch points alone (45%) or digital plus a brief follow-up call (25%). Through the Lumeon platform, patients can be assessed utilizing a pre-anesthesia questionnaire and data from the EHR. Patient-specific engagement strategies can then be created and conducted autonomously throughout the patient’s care journey to surgery.

In addition to the 70% of patients receiving automated care that saves time and resources, approximately 90% of the patients completed the digital assessment for surgery in a timely and accurate manner, demonstrating high levels of engagement. The digital automation of preoperative care allowed staff to focus on the 30% of patients—most with higher-risk health conditions—who required more in-person care. Additional impact on ROI is demonstrated in Figure 6 below.

Care team capacity increased by 130% within 12 months with 20% fewer staff



Clinician time in chart reduced from 11 minutes per patient to 2 minutes

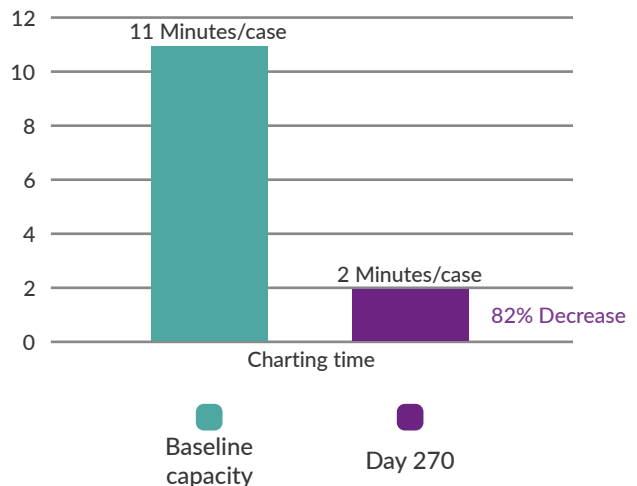


Figure 6. Impact of Lumeon care orchestration platform

CONCLUSION

New challenges in our post-COVID environment calls for new solutions. Care management, especially for bigger organizations, currently cannot be efficiently done without care orchestration tools.

For those on the Fee-for-Service (FFS) model, care orchestration benefits the revenue of the healthcare enterprise through increasing throughput (number of visits), staffing (smaller clinical teams), and keeping patients “in-network.” For any risk-owning organizations, it simply secures/improves their population management success and through that their contracts maintenance.

In 2023, it is no longer a question of whether we should use automation or not. It’s clear we should take advantage of reliable automation solutions to provide the best care for patients, to meet the growing demand for medical services, and to make the job a lot better for those on the frontline. The intelligent automation of care coordination is now a technological reality with the capacity to produce results and a positive ROI in a relatively short amount of time, particularly around the biggest challenges health systems have seen in decades – workforce, cost reduction and the need to generate revenue. Healthcare organizations of all sizes should give careful consideration to the adoption of these tools to meet the demands that health systems face today.



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