

Artificial Intelligence for Healthcare Administration: A Powerful Tool for Alleviating Administrative Burdens

February 09, 2023



Lead Research Analyst, Hybrid Cloud

Michael is Lead Research Analyst—Hybrid Cloud at Stratascale. He has a passion for business and technology.

Submitted by [Michael Sable](#) on 9, Feb 2023

Artificial Intelligence for Healthcare Administration: A Powerful Tool for Alleviating Administrative Burdens



Executive Summary

As of 2020, US healthcare spending accounts for nearly one-fifth of GDP, but the extremely fragmented structure of the system results in high overhead and administrative costs. The administrative burden includes tasks related to:

- record keeping
- benefits management
- prior authorizations
- claims denial
- fraud detection
- electronic health records
- regulatory compliance

These tasks not only contribute to wasted time and rising costs, they also drive professional dissatisfaction and burnout. Novel technologies such as artificial intelligence (AI) have emerged as a solution to help address this challenge:

- DeepScribe is making electronic health records more user-friendly.
- Sift Healthcare is enhancing the efficiency of the claims denial process.

- Banjo Health is streamlining the prior authorization process.
- Highmark Inc. is driving improved fraud reduction.

AI must still be supported and augmented by human intelligence but it's already proving to be a powerful time-saving tool.

The Administrative Burden of the American Healthcare System

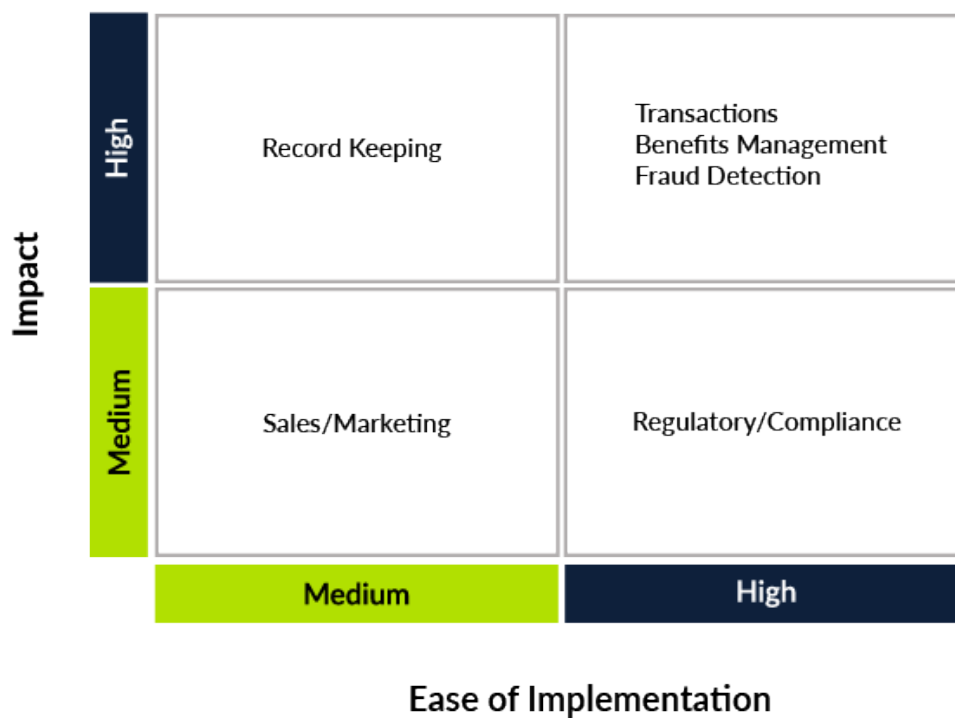
“If we do it right, we might be able to evolve a form of work that taps into our uniquely human capabilities and restores our humanity. The ultimate paradox is that this technology [AI] may become a powerful catalyst that we need to reclaim our humanity.” — [John Hagel](#)

Medicine is a uniquely human profession—a combination of science, technology, art, empathy, and above all, compassion. But all too often medical professionals are burdened by the weight of bureaucracy in the highly fragmented world of the American health care system. Indeed, of the nearly \$4 trillion spent on healthcare annually in the United States, administrative spending is about one-quarter of the [total expenditure](#). This heap of overhead generates a tremendous administrative burden for medical professionals. For example, activities that have nothing to do with patient care consume over half of a [nurse's workload](#) and nearly a fifth of [physician activities](#). Fortunately, artificial intelligence is emerging as a powerful technological tool to help alleviate this administrative burden at a time when it's becoming a professional and financial crisis in the health care industry.

Finding a way to leverage advanced technologies such as artificial intelligence to alleviate the administrative burden on medical professionals is important because healthcare is a huge component of the US economy. In 2020, US healthcare spending increased by 9.7% to \$4.1 trillion, or [19.7% of GDP](#). The healthcare information technology market is projected to almost triple to [\\$441 billion by 2025](#). While the size and scale of the American healthcare industry are notable, so too is its character. The American healthcare system is profoundly fragmented, and healthcare claims and billing are very complex processes due to a multitude of communication and transaction points involving many parties. For example, [filing a healthcare claim requires](#):

- confirmation with payers as to the validity of the medical necessity of a procedure before physicians are authorized to provide the service;
- physicians and patients must submit a claim to payers;
- payers need to review the claim and oftentimes contact providers for further details; payments have to be made through multiple clearinghouses and;
- occasionally, appeals by providers over disagreements regarding payment must be adjudicated.

Innovators have developed AI use cases in a number of areas related to healthcare administration. The below diagram evaluates several AI use cases based on their potential business impact and the ease of implementing the use case.



Source: Stratascale 2023

Implementation is never easy. Most activities require C-suite involvement and significant investment. But the impact is profound and the benefits are tremendous.

For more detail on the types of activities for each functional use case, see the following chart:

Administrative Activities in the US Health Care System

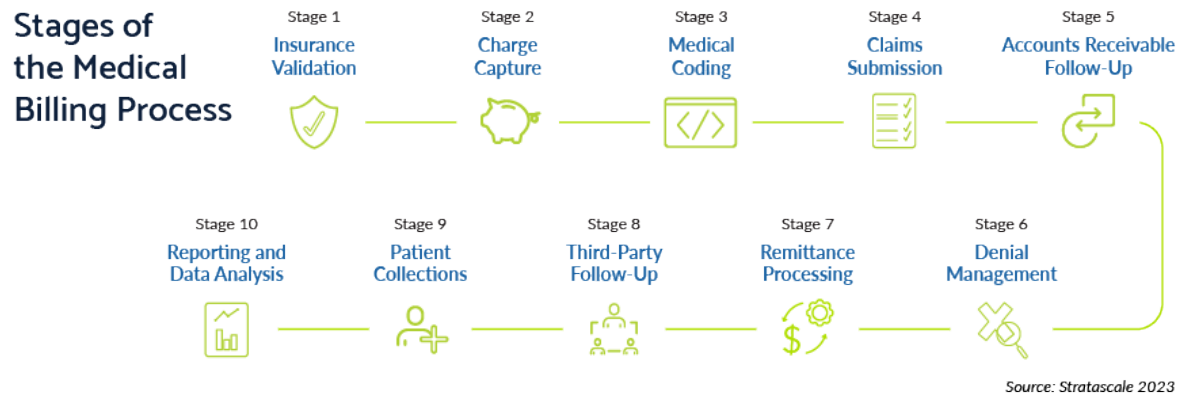
Function	Type of Activity
Record Keeping	Writing and inputting chart notes
Transactions	Billing, claims processing, filling prescriptions, ordering tests
Benefits Management	Insurance product design, verification of benefits
Fraud Detection	Identifying billing irregularities
Regulatory/Compliance	Activities to comply with government and nongovernmental regulations and accreditation, such as licensing, HIPAA compliance, OSHA, JCAHO, NCQA
Sales/Marketing	Producing, selling, or purchasing competitive products in the marketplace

Surprisingly, even in this digital age, keeping accurate chart notes is a major administrative bottleneck in the medical profession. Also, the US medical profession is one of the most highly regulated in the world.

For example, the privacy mandates intrinsic to the Health Insurance Portability and Accountability Act (HIPAA) mean that healthcare organizations must be very careful. HIPAA violations have cost organizations [over \\$75 million in fines since 2016](#). To avoid these penalties and maintain their licenses, doctors must pay careful attention to the regulatory stipulations of governmental bodies. The technology markets are recognizing this. They are also constrained by the fact that most (70%) of the actors in the healthcare market are technology novices, so adoption of AI and related technologies has been [slow](#). This is why RegTech—technology solutions that facilitate regulatory monitoring, reporting, and compliance—is a rapidly growing field as healthcare is becoming increasingly data- and technologically-oriented.

According to Juniper Research, [spending on RegTech rose](#) by an average of 48% per annum from \$10.6 billion in 2017 to \$76.3 billion in 2022. This technology is complex, and its effective deployment requires leveraging AI, big data, and machine learning in the cloud, which is already a novice capability for most healthcare organizations.

In the for-profit US healthcare system, one of the most important administrative tasks is medical billing, which is especially burdensome:



The entire process is time-consuming, complex, and draining for many medical professionals. There are now a whole host of administrative activities not related to patients that medical professionals must be involved in. These detract time and energy which could be better spent on serving their patients.

The Impact of the Administrative Burden on Job Satisfaction in the Healthcare Industry

The administrative burden on medical professionals has become a serious impediment to employee satisfaction within the healthcare industry. In many different studies across specialties, surveyed medical professionals consistently indicate that administrative tasks drain not only their time and energy, but also their motivation. The prevailing mantra is: [“This isn’t why I went into medicine.”](#)

Ironically, the problem has been worsened by the electronic health records (EHR) that approximately 90% of physicians now use. EHR were originally envisioned as a way to streamline and enhance data sharing, but they have instead become a tremendous [time-suck](#). Physicians in outpatient settings spend about 27% of their day on direct clinical face time with patients but 49% on EHRs and desk work, with many working up to two hours every evening on [EHR-related tasks](#). Moreover, the

increasing emphasis on quality metrics that physicians must document has resulted in [more administrative work for medical professionals](#).

Yet another administrative bottleneck involves treatments and medications—these typically require prior authorizations from payers, which takes up even more time and energy. According to a 2020 American Medical Association survey, 86% of physicians indicated that the administrative burden of prior authorizations was “[high or extremely high](#).” According to the [Medical Economics Physician Report](#), prior authorizations consumed, on average, more than 16 hours per week for medical professionals and their staff. The overall result: This administrative burden is linked to rising physician burnout rates across the healthcare industry.

A 2021 survey by the Physicians Foundation indicated that 56% of independent physicians and 66% of primary care physicians reported frequent [burnout symptoms](#). The impact of physician burnout is immense. It’s estimated to cost the US healthcare system \$4.6 billion annually and is also regarded as a [significant contributing factor](#) to the anticipated shortage of 139,000 doctors by 2033.

According to [a poll of 2,000 physicians](#) by Doximity, 46% of physicians believe that decreasing the administrative burden would be the most effective way to reduce burnout, with improving work-life balance at a distant second (27%) followed by reducing clinical caseload (21%). Dr. Jack Resneck, a past chairman of the American Medical Association Board of Trustees, [summarizes](#): “The data show that the things that cause burnout are the things that get in the way of why you went into medicine in the first place, such as being able to provide the kind of care you want to provide to your patients.”

It should be noted that the problem of administrative burden affects diverse medical professionals, including primary care doctors, surgeons, and specialists. For example, according to [a broad based poll](#) by Doximity, 60% of doctors in family medicine, 58% of neurosurgeons, 45% of pediatricians, and 41% of anesthesiologists favor decreasing the administrative burden. What is the solution? How can we harness emerging technologies such as artificial intelligence to reduce burnout and, as John Hagel suggests, bring humanity back to this work?

The Catalytic Role of Artificial Intelligence in Addressing Healthcare’s Administrative Burden

Artificial intelligence applications deployed through cloud infrastructure have the potential to revolutionize healthcare. A few of the use cases include:

- robot-assisted surgery with a potential annual value of \$40 billion by 2026;
- administrative workflow with \$18 billion in savings;
- fraud detection with savings of \$17 billion and;
- cybersecurity, which adds \$2 billion in [value](#).

AI-related healthcare applications can drive tremendous value. The immediate priorities for most healthcare providers involve enhancing the efficiency of back-office operations in the cumbersome, fragmented US healthcare bureaucracy. To alleviate this administrative burden and foster efficient administrative workflows, healthcare workers need access to services that can help them understand how to effectively harness [AI technologies such as voice-to-text transcriptions](#), which eliminate time-consuming activities such as writing chart notes, filling prescriptions, and ordering tests. Savings realized could be as high as \$18 billion by 2026.

Artificial Intelligence in Fraud Detection

Healthcare fraud is a serious problem in the US. It's estimated that approximately 3% of annual healthcare spending is [fraudulent](#), costing Americans [\\$68 billion annually](#). Artificial intelligence has emerged as a powerful tool to address this problem. [AI-related data mining coupled with AI-based neural networks](#) that search Medicare claims for patterns associated with medical reimbursement fraud can save the healthcare system an estimated \$17 billion annually, simply by improving the speed and accuracy of fraud detection in Medicare claims. Companies are [already active](#) in this space. For example, the health insurance company [Highmark Inc. has reported](#) saving \$245 million in fraud, waste, and abuse (FWA) due to the use of artificial intelligence software by the company's Financial Investigations and Provider Review Department. [According to Melissa Anderson](#), Highmark's chief auditor and compliance officer: "AI allows Highmark to detect and prevent suspicious activity more quickly, update insurance policies and guidelines, and stay ahead of new schemes and bad actors." Indeed, the technology is so effective that already 44% of the largest insurers are using AI to [detect fraud](#). But the technology does have accuracy limitations. False positives—cases that look like fraud at first glance but are actually legitimate—are a [major impediment to widespread adoption](#). 66% of executives in a Brighterion AI survey indicated that reducing false positives

was [“extremely important”](#) when choosing an AI provider. Consequently, AI remains a tool to empower skilled workers but it does not replace them.

Using AI to enhance insurance fraud detection could result in [\\$17 billion in savings](#) for the healthcare industry by 2026. Although medical professionals, particularly nurses, are often on the frontlines of flagging fraud, this is primarily a back-office activity. [Fraud detection traditionally relies](#) on a combination of manual and computerized/rules-based reviews of medical claims. It’s important to have sound mechanisms of fraud detection not only for financial reasons but because hospitals and medical professionals may be legally liable if they’re late in acting to prevent fraud when federal funds such as Medicaid finance the medical procedures. Still, fraud detection is a time-consuming activity. This is all the more reason to leverage novel technologies such as artificial intelligence in this area.

At present, health insurers are [experimenting with AI-supported data mining coupled with AI-based neural networks](#) to search Medicare claims for patterns associated with medical reimbursement fraud. According to [consulting firm McKinsey](#), predominantly manual tasks in the medical claims process such as technical claims auditing, medical claims auditing, and claims approval or denial could be greatly expedited and improved through fully integrated, real-time claims auditing by self-learning algorithms in the cloud. The key AI technology involves the self-learning algorithms which leverage massive amounts of cloud-hosted data to detect patterns and then provide a customized response within seconds.

Artificial Intelligence in EHR: Usability Enhancement

Numerous AI-enabled solutions have emerged to help alleviate the administrative burden on medical professionals. As noted earlier, EHRs have become a ubiquitous tool, with the market [expected to reach \\$33.4 billion](#) by 2025. Still, they have contributed to an increase in the administrative burden on physicians and nurses. By using artificial intelligence to make EHRs more user-friendly, however, the true value of this technology can be unlocked.

Industry practitioners and user-centered designers [have criticized EHRs](#) for being developed as data reservoirs with clunky interfaces that show little regard for their use in real world medical contexts. Poor front-end design results in more time

required to input healthcare data. Also, while many doctors have poor handwriting, they often have poor typing skills as well. We can improve EHR efficiency by using voice recognition to allow medical professionals to input the data quickly and accurately.

A leading example of an AI-enabled EHR product is offered by [DeepScribe](#). DeepScribe is a HIPAA-compliant software application that doctors can use to record information garnered through doctor-patient conversations and [produce comprehensive clinical records](#). To maximize accuracy, each transcription is read by a medical student, who acts as a failsafe to bridge the gap between the AI and the EHR. These students can leverage their knowledge and experience to flag inaccuracies or tell if a medication name or diagnosis has been [misspelled or swapped](#). DeepScribe integrates with the EHRs of multiple companies, including those offered by Athenahealth, Claimpower, and Elation. DeepScribe's value proposition aims at both compliance and efficiency. On the compliance side, it addresses the 2009 HITECH Act, which requires doctors to maintain digital documentation of all patient interactions and appointments. On the efficiency side, DeepScribe claims their tool saves doctors about three hours of work per day on average while generating [more accurate results](#).

Artificial Intelligence in Improving Claims Denial Process

Artificial intelligence can also enhance the efficiency of administration and back-office operations in health care by helping to prevent claim denials. [According to a study](#) by the Kaiser Family Foundation, insurers deny about 18% of in-network medical claims, resulting in time-consuming and costly peer reviews and appeals. Sift Healthcare is using artificial intelligence and machine learning to address this problem. They point out that 86% of collectable denial dollars can be found in 25% of claims; the 10% of patients least likely to pay their bills account for more than 50% of outstanding patient bills and also pay less than 5% of their bills; and 40% of total patient payment write-off dollars can be found in 10% of accounts. Sift leverages historical payments data and model-based monitoring to identify billing patterns that require payer-specific claim edits. By using artificial intelligence, Sift reduces the risk of future denials to [optimize payments and drive revenue strategy](#). The company's products currently include AI-Driven Denials Management, Patient

Payments Intelligence, Payments Intelligence Platform, and Rev/Track.

Artificial Intelligence in Automating Prior Authorization Process

Vendors are also using artificial intelligence to address prior authorization. Automating prior authorization enables payers to receive prior authorization requests directly from providers [electronically](#). These solutions aim to streamline the steps associated with prior authorizations, ranging from determination to request submission to status checking. Banjo Health is developing a decision support platform that uses AI to customize the platform according to specific prior authorization criteria, which makes prior authorization more efficient. By integrating the decision platform with EHRs, the company can draw from medical notes to drive accurate decisions while reducing the administrative burden on [both the payer and the provider's staff](#). The [company's vision](#) is to reduce the turnaround time from days to hours by using a solution that makes refined, compliant prior authorization decisions automatically and iteratively becomes more accurate with each decision.

Conclusion

Alleviating the administrative burden in America's complex healthcare system is absolutely essential to address its increasing financial and human costs. Fortunately, artificial intelligence technology is rapidly maturing to the point where it can have a substantial impact on this problem. AI applications can dramatically improve billing, EHRs, claims denials, prior authorization, and fraud detection. However, artificial intelligence has not yet matured to the point that it can be fully automated. In a life-or-death industry like healthcare, regulators greatly prefer some level of human involvement. According to Jodi Daniel, the former head of the Office of Policy in the Office of the National Coordinator for Health Information Technology: "If you look at (FDA) oversight of clinical decision support tools, they treat tools that have a physician intermediary or clinician intermediary very differently than those that are fully automated." Still, the impact of a tool that is over 90% accurate but only requires human involvement to maximize its utility is sufficiently profound. It can greatly alleviate the administrative burden on medical professionals while unlocking enormous cost, efficiency, and medical advantages. The history of AI shows that, as computational power and the amount of data available for analysis increases, the utility and accuracy of the artificial intelligence system will rise exponentially. The

future is bright.