DATA-DRIVEN HEALTHCARE

Incorporating
Revenue Intelligence
Into Your Practice Operations

Prepared by

REVOPS | HEALTH

Introduction
Healthcare is data-driven

Over the last three decades, increasing coding complexity, expanded regulations, and the proliferation of different insurance payment models has made medical reimbursement very complex[1]. Requesting, receiving, and tracking practice reimbursement for services provided has become increasingly difficult for healthcare providers and practice leaders.

Development and application of advanced analytics and AI-powered technologies in the last decade has created an imbalance in reimbursement that favors those who can afford or develop them – such as large healthcare organizations and insurance companies. The lack of high-quality but affordable advanced revenue cycle analytics software for small-to-midsize provider groups and independent practices continue to place them at a disadvantage in getting appropriately reimbursed for services provided.

Here, we review the current state of revenue intelligence analytics for provider practices, discuss the urgent need for provider practices to adopt artificial intelligence (AI)-powered analytics tools, and review examples of use cases where advanced analytics can improve reimbursement, assist practice leaders in navigating increasingly complex payer behavior, and use rich claims data to make better business decisions.

Executive Summary

- Medical reimbursement becoming increasingly complex, beyond the capability of individual humans to manage
- Large hospital networks and insurance companies leverage data to optimize their reimbursement operations
- Small- to mid-size practice groups (1 – 50 providers) must field similar capabilities to remain competitive but can't afford developing custom solutions

Key Takeaways

Modern *Revenue Intelligence* solutions must address the following:

- DATA QUALITY – *repair & reconcile broken or incomplete records*
- EASE OF USE – *intuitive, real-time data mining & visualization*
- SECURITY – *limit access to data & insights according to role*
- AUTOMATION – *improve reliability, increase accuracy, faster processing*
- SIMPLE DEPLOYMENT – *fast, reliable installation*
- AFFORDABLE – *commodity pricing*

Problem
Reimbursement is too complex for humans to manage alone

It's getting harder for providers to get paid equitably or fairly for care delivered.

The overall increasing complexity of revenue cycle management has resulted in an exponential increase in data complexity. This trend has favored key groups in the healthcare payment space that can build and utilize advanced data management systems to track and adjust payment behavior. The first group is healthcare insurance companies. Many insurance companies have built in-house data analytics teams to track healthcare delivery and adjust payment models rapidly[6]. This asymmetric investment in data analytics enables payers to quickly adjust rules and regulations (often unilaterally) that may take providers many months to identify (as subtle changes in denial rates buried in mountains of claims data)[7].

Large healthcare networks have responded to this changing landscape in several ways. Many larger networks also have assembled in-house data science teams to mine their clinical and revenue cycle management systems, and their institutional or

network claims data[8]. This is an expensive approach, as appropriately qualified workers are costly to find and hire. Turnover can be high as workers are constantly recruited to the technology sector, resulting in ongoing loss of institutional knowledge. Many large hospital networks have invested in third-party technology start-ups to help them develop tools for revenue cycle management[9]. For example, Cleveland Clinic, Mayo Clinic, and the Mount Sinai hospital networks have each established large venture capital arms to fund healthcare technology endeavors.

Even in these instances, data integrity and complexity pose unique challenges that have not been completely overcome in larger hospital networks. The presence of multiple clinical software systems and lack of integration across different components of the network, such as individual hospitals and provider groups, still limits the ability of hospital networks to reliably collate data accurately for a comprehensive single view and to mine claims data in a usable manner. Even here, any systems queries and data collation still needs to be performed by data scientists and informatics staff. Despite inaccurate and limited data management capabilities, large practice networks have still leveraged their asymmetric advantage in data analytics to merge smaller practices by offering

managed service organization (MSO) services with better reimbursement efficiency[10, 11].

How are independent practices handling this now? Not well.

Unlike insurance payers and large hospitals and healthcare networks, small-to-medium sized providers (1-50 billing providers) currently have very limited access to advanced data analytics that they can use to monitor their revenue cycle management systems and track their reimbursement. Many practice administrators already recognize the need to track their revenue cycle processes to identify opportunities to increase billing efficiency (reduce denials), reduce time to payment, and maximize appropriate reimbursement for services provided. However, there are several critical challenges that practice administrators face when trying to address this gap.

One key barrier for practices is having appropriate skilled administrative staff to collect data, review data, and track or make process improvements. Each of these tasks requires different skill sets – including expertise in data analysis, collation, software use, and financial accounting – which

means that practices need to higher multiple individuals to meet these needs, ensure training of existing staff in key topic areas, or may simply lack critical skill sets in their existing staff. Advanced analytics tools that can automatically assemble revenue data can allow administrative staff to focus on activities that improve reimbursement efficiency.

Secondly, without the ability to develop in-house solutions, many of the tools that are currently available to small and medium sized independent practices in the healthcare technology marketplace are limited and share several common deficiencies. Many of these have been developed more than ten years ago, without leveraging recent advances in data management (such as cloud-based technology or artificial intelligence algorithms). They have also often been developed as 'add-ons' to existing technology rather than with a primary focus on revenue analytics, and without the end users in mind (practice administrators, providers, and billing staff). Often, current solutions are only available as part of a larger software ecosystem – requiring practices to purchase access simultaneously to an EHR, practice management system, or third-party billing software. This model commits practices to sub-optimal revenue analytics software, and may prevent them from purchasing more advanced tools or using best-in-breed platforms in their respective specialties.

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Computer-assisted revenue operations

Available tools are ancient. What should modern revenue intelligence and analytics look like?

The optimal revenue intelligence and analytics software system should have several specific characteristics that maximize functionality and usability, provide quick accessibility and visibility into data, and incorporate advanced tools for data mining. This is especially important for small-to-medium sized provider practices, which are at the intersection of increasingly complex data that cannot be analyzed by any single individual. Based on our review of the revenue cycle management technology space, most existing solutions have not been able to deliver an optimal experience for practices to date.   The following elements are critical for user adoption and effective use.

First and foremost, revenue intelligence and analytics software should be completely *agnostic* to existing software systems. An optimal software platform should be able to integrate and acquire relevant practice and claims data from existing practice management, EHR, and billing software systems – to avoid the need to 'rip-and-replace' existing software systems. The healthcare technology space has evolved to support this approach – with many or all systems providing application program interfaces (APIs) for software programs to interact. In instances where this is not possible, the optimal software platform should have automated technology to use secure web-based user interfaces to access reimbursement data.   Newer technologies should be *cloud-based* software platforms, so as to leverage available and cost-effective data storage and faster processing options to provide cheaper solutions for practices. Individual and segregated cloud-based units should be provided to safely store practice data without mixing it with other customers to ensure patient data security.

One of the critical gaps in current technologies has been in assembling data from various sources into a *single high-quality data set*. As an example, data errors and inconsistencies from poor data entry can prevent accurate data mining and lead to downstream inaccurate data analysis [**FIGURE 1**]. With appropriate expertise, automated data collation using AI-powered data assembly

algorithms should drive data integration. However, applying more advanced tools such as AI and machine learning to an incorrect data set will lead to incorrect findings. Similarly, poorly designed or applied AI algorithms can also lead to an incorrect singular data, with disastrous consequences. A case-in-point is a recent study identifying that a commonly used AI algorithm to predict infection in hospitalized patients had a 40% inaccuracy rate, leading to multiple incorrect diagnoses and wasted hospital resources[14]. Therefore, practice administrators should have the utmost confidence that all of their practice reimbursement and business decisions will be based on high quality data. Along these lines, as there can be error rates

Once a high-quality data set is assembled, modern revenue analytics platforms should incorporate several additional features to allow practice administrators to utilize reimbursement to maximal advantage. Claims data itself is an extremely rich and robust data source, with the added benefit of being in standardized formats (e.g., 835 and 837 forms) as established by the Health Insurance Portability and Accountability Act. Various aspects of these files can be mined to provide visibility to practice leaders beyond claims reimbursement and denials – including patient demographics, provider performance, and services provided based on specific disease conditions, to name a few. To effectively access this data, the user interface and
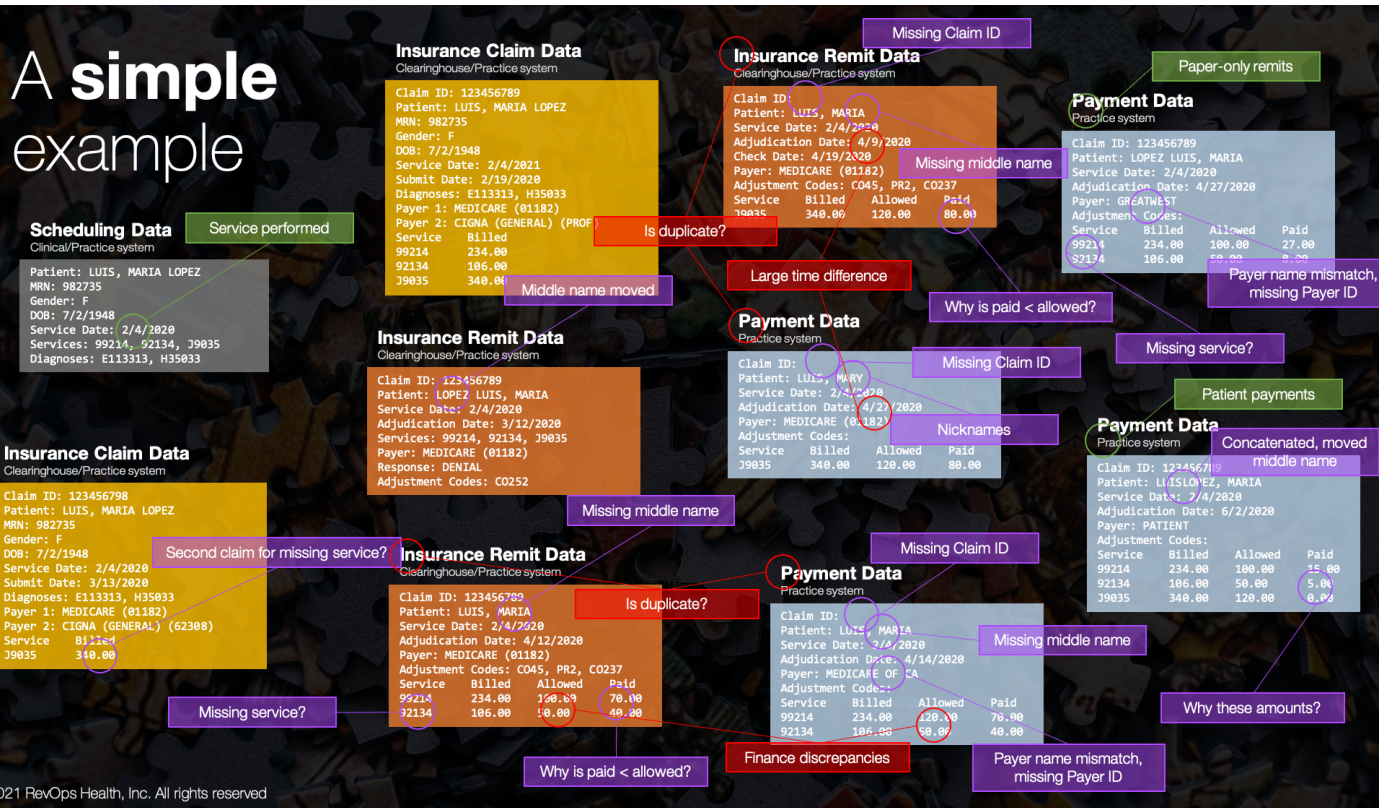
of >20% in data across multiple sources, revenue analytics software should provide *data transparency* – clearly marking and identifying files that have been corrected or collated. Practice administrators should be able to clearly audit errors in their data sources, which themselves may be a source of claim denials, with mechanisms to easily export data for independent review, verification, and validation.

software platform should support ***multiple perspectives of the data***, easy data assembly, and mining of all potential search terms.

In addition, incorporation of high-quality and accurate AI and machine learning-based tools should enable ***anomaly detection*** in reimbursement data, to easily call out subtle changes in practice performance for practice

administrators.   Given the overall complexity of modern claims data, coding, and practice structures – it is impossible for practice administrators themselves to monitor for subtle changes in their performance data, particularly when this involves multifactor analysis (e.g., for service code, practice site, provider, and insurance denial reason). For example, with sufficient historical data, machine learning can be successfully leveraged to detect subtle changes in payer behavior for specific services. However, careful tuning of the system is required to ensure that actionable and relevant alerts are generated and sufficiently separated out from background noise.   Ultimately, new healthcare revenue intelligence platforms should provide practices with industry-leading technology that provide an advantage over similar solutions being deployed by payers or large healthcare networks.

Finally, there are a number of practical considerations to adoption of an optimal revenue analytics solution. Any new platform must be easy to implement, with **low-effort practice deployment**. Integration into existing practice management and billing systems should be simple and reliable and require little to no administrative oversight by practice administrators, who in most practices, do not have the technical expertise to oversee software implementation. Substantial administrative oversight and active interaction (e.g., manual data uploads by administrative staff) are additional barriers integration into daily workflow, and therefore, technology adoption. Similarly, on-site data storage and management also requires costly infrastructure and support staff.

Additionally, an optimal system should recognize that many different types of users will interface with the software to access reimbursement data for the practice – and therefore, should support **role-based access control** (or RBAC) to create different user profiles that support role-specific functions. RBAC is well-recognized structure that is embedded in many enterprise-level software platforms and should be present in revenue analytics platforms as well. For practices, this means that practice leaders can see overall revenue and practice performance metrics, while simultaneously designating appropriate and relevant data access that is specific to each individual role. For example, the practice CEO or managing partner can view overall practice and provider performance metrics, while a site manager may only see data related to their specific practice site, and a billing administrator may only see claims that require action by them. The presence of RBAC in the platform is essential to ensuring maximal functionality for a practice.

Most importantly, an optimal revenue analytics system should be **cost-effective and affordable**. The average practice spends upward of $37,000 per provider annually on healthcare software to support various functions, and most small-to-medium practices are very price sensitive given existing administrative overhead costs.   For widespread use and adoption, any solution should be transparent in pricing, and appropriately matched to the Identification of even 2-3 errant denials per provider per month can easily justify the cost of an affordable solution.

"Revenue Intelligence uses large amounts of insurance and practice data to compute a digital model of a provider group's business operations. The model can be used to discover patterns and insights that might otherwise be difficult to detect by manual means."

Revenue intelligence in the real world

Here, we present several examples of how a well-designed healthcare revenue intelligence software platform offered by RevOps Health can be deployed to monitor practice reimbursement, easily identify changing denial rates, reduce days to payment, and support business decisions.

Use Case 1: Did we get paid for all the care that we provided?

Problem: For a small practice, ensuring that every patient encounter that occurred resulted in a claim prepared and filed for insurance reimbursement is essential. One practice administrator noticed that the number of claims filed did not match the number of patients seen in the practice. However, since claims preparation and filing was out-sourced to a third-party biller, there was limited ability in their software platform to look at claims and match it to patient encounters.

ROH: Patient encounter data was accessed from their practice management system and matched to claims data from their clearinghouse system.

Solution: Identified 10% of services over 12-month period scheduled and performed in practice management system for which no claim had been filed. The practice administrator addressed this

with their third-party billers.

Use Case 2. Can we reduce days to payment?

Problem: The length of time it takes from performing a service to final payment varies depending on the insurance payer, service provider, and timeliness of claim filing and response to any remittances. Most software systems do not provide visibility into claim transit times, limiting the steps practice administrators can take to reduce days in accounts receivable (AR).

ROH: By breaking down the various components of days in accounts receivable across different parts of the practice, administrators have visibility on how long it takes to initial submission across services and providers; and can see how long it takes to re-file amended claims.

Solution: Practice administrators can focus on those steps that are modifiable (e.g., reducing days to initial submission). In one practice, following introduction of RevOps Health software, days in AR were by 54% reduced across the practice.

Use Case 3. Where should a practice locate an additional office and what services should they provide?

Problem: Practice expansion can be a challenging and complex decision – and it is difficult to incorporate existing practice demographic data and referrer locations into planning.

ROH: Well-organized claims data can be a rich source of data for practice planning. Patient demographic and location data is matched to volume, diagnoses, and services to provide detailed geographic data through a mapping function.

Solution: Practice administrators can use location data and referrer analysis to identify the next optimal site to off-load a portion of their busy practice, with the goal of increasing local referral volume and reducing patient commute time.

Use Case 4. There is too much practice revenue data for a practice administrator to track – how can they pick up subtle changes in reimbursement performance?

Problem: There are many factors that can influence key practice performance indices, including services provided, and changes to insurance behavior can be difficult to track.

ROH: Using its AI and machine-learning-powered anomaly detection program to survey recent practice data compared to similar practice data over the last 12 months, a 25% decrease reimbursement was identified. Matched to other key indices, such as volume, revenue, and days to payment, ROH demonstrated that the decrease in reimbursement was due to increasing denials, and provided a list of denied claims in that period.

Solution: Practice administrators can easily review anomalies in their reimbursement data, and access patient and claim-specific data to rectify re-file claims that were denied.

Use Case 5. A practice is considering a new billing company – how do they compare performance to their prior biller?

Problem: Practice administrators need to assess performance of their third-party billing company and may change billers to improve their revenue cycle management performance.

ROH: Prior practice revenue and claims data can assembled and presented in parallel to new biller data, allowing practice administrators to compare performance of the new biller to the prior company – in detail and broken down based on services, payers, denial rates, sites, and providers, among other factors.

Solution: Practice administrators can easily compare performance of their new biller to their past RCM performance and work with them to easily identify those claims and services that require closer attention and review to achieve optimal performance. Through ROH, practice administrates get data analysis that is independent of the billing company, providing them with an agnostic view of billing performance.

Conclusion
Don't get left behind

Now, more than ever, there is a need for sophisticated healthcare intelligence platforms that leverage modern-day technical developments, including AI-powered data assembly, cloud-based technology, and ML-powered anomaly detection, to help provider practices get paid for the care that they provide.

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References

1. Blazer DG for the Committee on Health Care Utilization and Adults with Disabilities. "Chapter 3: Change patterns of health insurance and health-care delivery." In: Health-care utilization as a proxy in disability determination. National Academies of Sciences, Engineering, and Medicine; National Academies Press (US); Mar 1 2018.
2. Drash W. "Insurers skips doctors and sends massive checks to patients, prompting million-dollar lawsuit." https://www.cnn.com/2019/03/01/health/anthem-insurance-payments-patients-eprise/index.html. Mar 1 2019.
3. LaPointe J. "Insurance and medical billing costs for providers reaches $282B". https://revcycleintelligence.com/news/insurance-and-medical-billing-costs-for-providers-reaches-282b. Apr 11 2019.
4. Cohen S. "Instead of prior authorization, insurers should go back to the old 'pay-and-chase' model". https://www.statnews.com/2021/03/11/instead-of-prior-authorization-insurers-should-go-back-to-the-old-pay-and-chase-model. Mar 11 2021.
5. LaPointe J. "Hospital claim denials steadily rising, increasing 23% in 2020." https://revcycleintelligence.com/news/hospital-claim-denials-steadily-rising-increasing-23-in-2020. Feb 4 2021.
6. Waddill K. "How payer forecasting is shifting towards real-time data analytics." https://healthpayerintelligence.com/features/how-payer-forecasting-is-shifting-towards-real-time-data-analytics. Feb 12 2021.
7. Gavidia M. "Medical claim denial rates rising, highest in initial COVID-19 hotspots." https://www.ajmc.com/view/medical-claim-denial-rates-rising-highest-in-initial-covid-19-hotspots. Jan 21 2021.
8. Muller RW. "Transforming hospitals through reform of the care process." In: Engineering a learning healthcare system: A look at the future: Workshop Summary. Institute of Medicine (US) and National Academy of Engineering (US) Roundtable on Value & Science-Driven Health Care. National Academies Press (US); 2011.
9. Dyrda L. "20 health systems with investment arms". https://www.beckershospitalreview.com/digital-transformation/20-health-systems-with-investment-arms.html. Aug 6 2020.
10. Meyer H. "Specialty physician groups attracting private equity investment." https://www.modernhealthcare.com/physicians/specialty-physician-groups-attracting-private-equity-investment. Aug 31 2019.
11. Flanigan B and Elsner N. "Six physician alignment strategies health systems can consider." https://www2.deloitte.com/content/dam/Deloitte/us/Documents/life-sciences-health-care/us-lshc-six-physician-alignment-strategies.pdf. 2018.
12. Snell E. "What is driving digital healthcare startup growth?" https://revcycleintelligence.com/news/what-is-driving-digital-healthcare-startup-growth. Sep 22 2014.
13. Gee E. and Spiro T. "Excess administrative costs burden the U.S. health care system." https://cdn.americanprogress.org/content/uploads/2019/04/03105330/Admin-Costs-brief.pdf
14. Wong A. et al. "External validation of a widely implemented proprietary sepsis prediction model in hospitalized patients." JAMA Int Med Jun 21 2021.