EBOOK

Next-Gen Healthcare Data Management

Tamr

Every medical provider believes in patient safety, but medical errors are still one of the leading causes of death in the United States. Each year, a silent pandemic of as many as **440,000 deaths** can be attributed to errors in care, including preventable adverse effects, mistakes involving the type and dose of medication, or a breakdown in communication. Many of these errors result from providers simply not having the information they need at the point of care. Bad data is an issue in every industry, but in the case of patient care, bad data can mean the difference between life and death.

Recognizing the need to improve data access for patients and providers, the Centers for Medicare and Medicaid Services (CMS) and the Office of the National Coordinator for Health Information Technology (ONC) have implemented interoperability rules and compliance timelines. However, the time and effort needed to break down data silos to clean and curate data have made traditional methods obsolete when managing a firehose of patient data. There is a great unmet medical need for next-generation data mastering solutions that can dramatically increase the quality of patient and provider data to improve patient care while reducing costs.

440,000

The Need for Next-Generation Patient and Provider Mastering

Getting unified patient data in the right hands can avoid medical errors, readmissions, and unnecessary treatment that can save lives, reduce costs, and improve patient care. For years, state and government agencies have tried to achieve these benefits by compiling and sharing an overwhelming amount of patient data. But the volume and complexity of the data made it difficult to realize results.

The same holds true on the provider side. When hospitals or physician practices merge, or health systems acquire hospitals and physician practices, the provider networks become even more complex and concentrated. At the practice level, a provider may be associated with one or more practices within a group. And each provider is often associated with a larger group and site with facilities in multiple regions as well.

Given the scale and complexity of patient and provider data, a human-guided, machine learning-driven mastering approach is essential.

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Data Challenges in Patient and Provider Mastering

In order to utilize the full value of patient data effectively, it needs to be integrated. One solution is to use an enterprise master patient index (EMPI) to try and maintain consistent and accurate information about each patient. However, the reality is that healthcare data is diverse and stored in interoperable data silos. The number of silos is an increasing problem as the sources for patient data continues to grow, including multiple electronic health record (EHR) systems (Epic, Cerner, Meditech, and the customized instances of these third-party products for each provider institution), prescription data (CVS Caremark, OptumRx, Express Scripts), insurance claims (UnitedHealth, Anthem, Aetna), lab results (Quest, LabCorp), and many more (FIGURE 1).

Additionally, every patient is now generating their own data as they begin to manage their health using a combination of personal health and fitness applications/systems. In order for patients and their primary care providers to deliver a higher quality of care at a lower cost, patients and providers must use longitudinal data regardless of where the data is generated. True outcome-based, long-term care will require the integration of patient-generated data with data that is generated by their providers or inside of healthcare institutions.

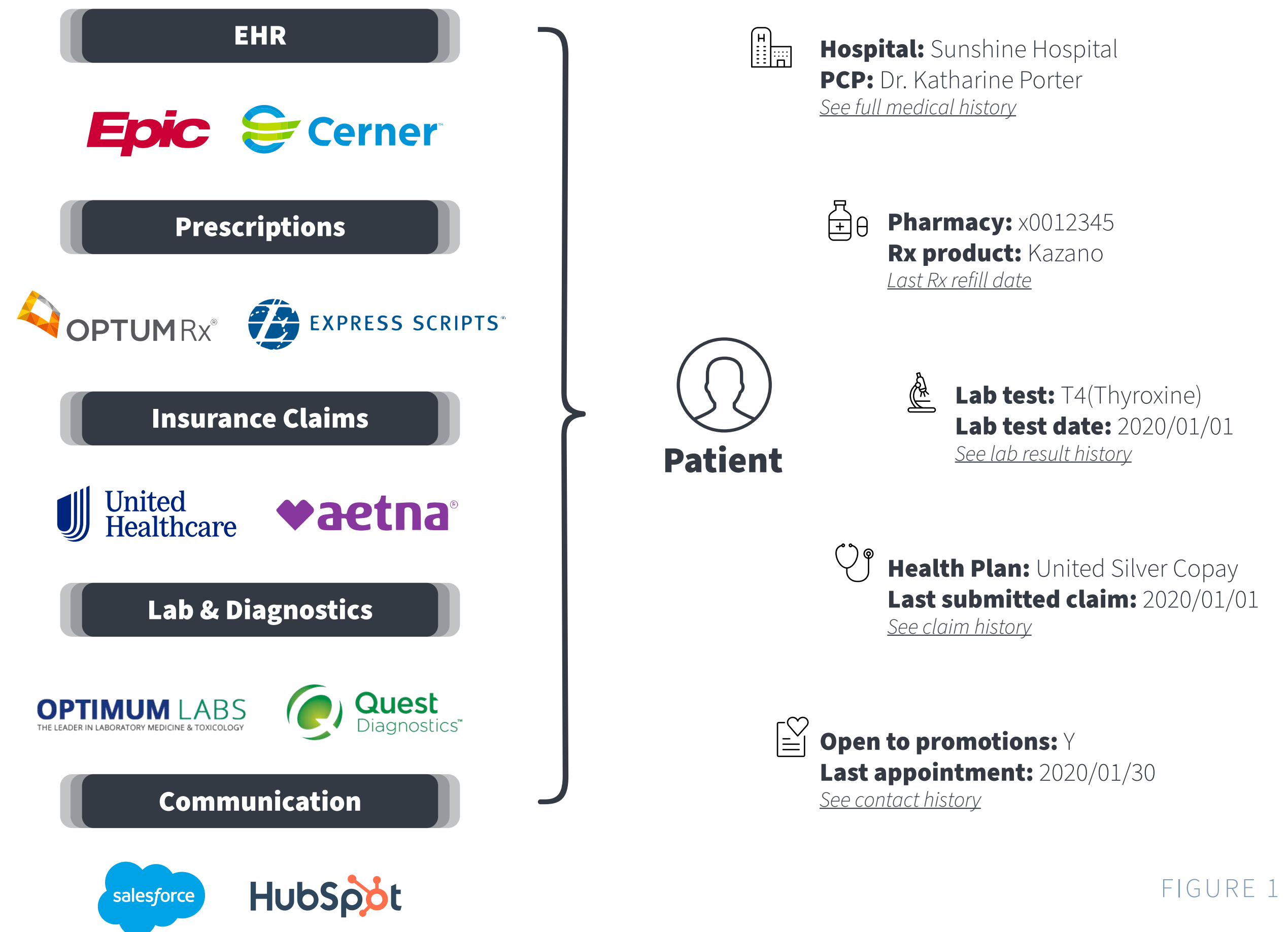- 360-view of patient care   • Persistent Patient ID   • Agile onboarding of sources

Hospital: Sunshine Hospital
PCP: Dr. Katharine Porter
See full medical history

Pharmacy: x0012345
Rx product: Kazano
Last Rx refill date

Lab test: T4(Thyroxine)
Lab test date: 2020/01/01
See lab result history

Health Plan: United Silver Copay
Last submitted claim: 2020/01/01
See claim history

Open to promotions: Y
Last appointment: 2020/01/30
See contact history

FIGURE 1

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However, differences between EHR systems and other sources often make it difficult to generate or reconcile/match the data to EMPIs, and reduce the possibility of exchanging clean data. Traditional ways to reconcile different data schema from each system to make them interoperable requires complicated, manual efforts with frequent and ongoing maintenance by a team of data engineers. In addition, many patient records are missing vital information (e.g., changes in prescriptions or contact information) or are potential duplicates that require merging or resolution. Writing rules to dictate specific matching criteria can help automate some of this effort. Still, rules-based approaches will always have limitations in their ability to solve these problems at any scale. And, rules-based approaches do not have the flexibility to maintain accuracy in the face of a dramatic increase in the number of new data sources and increasing frequency of updating datasets.

When it comes to providers, the data challenges are equally as complex. Providers often have complex and changing associations in a network (FIGURE 2). As well, fragmented, duplicated information in disparate, disconnected systems is common when it comes to provider data. For years, government agencies and health organizations have been compiling and sharing healthcare data sources, including electronic medical records (EMRs), EHRs, prescription data, insurance claims, payment data, and more. And while all providers have a unique 10-digit identifier, aka a National Provider Index (NPI), a standard maintained across the US, it lacks quality and often contains fat-fingered data entry or the inadvertent addition of suffixes. There is a need for healthcare organizations to streamline operations around unifying provider data despite these errors, reduced turnaround times to onboard providers, and a provider 360 view with connections to their payers and insurances.
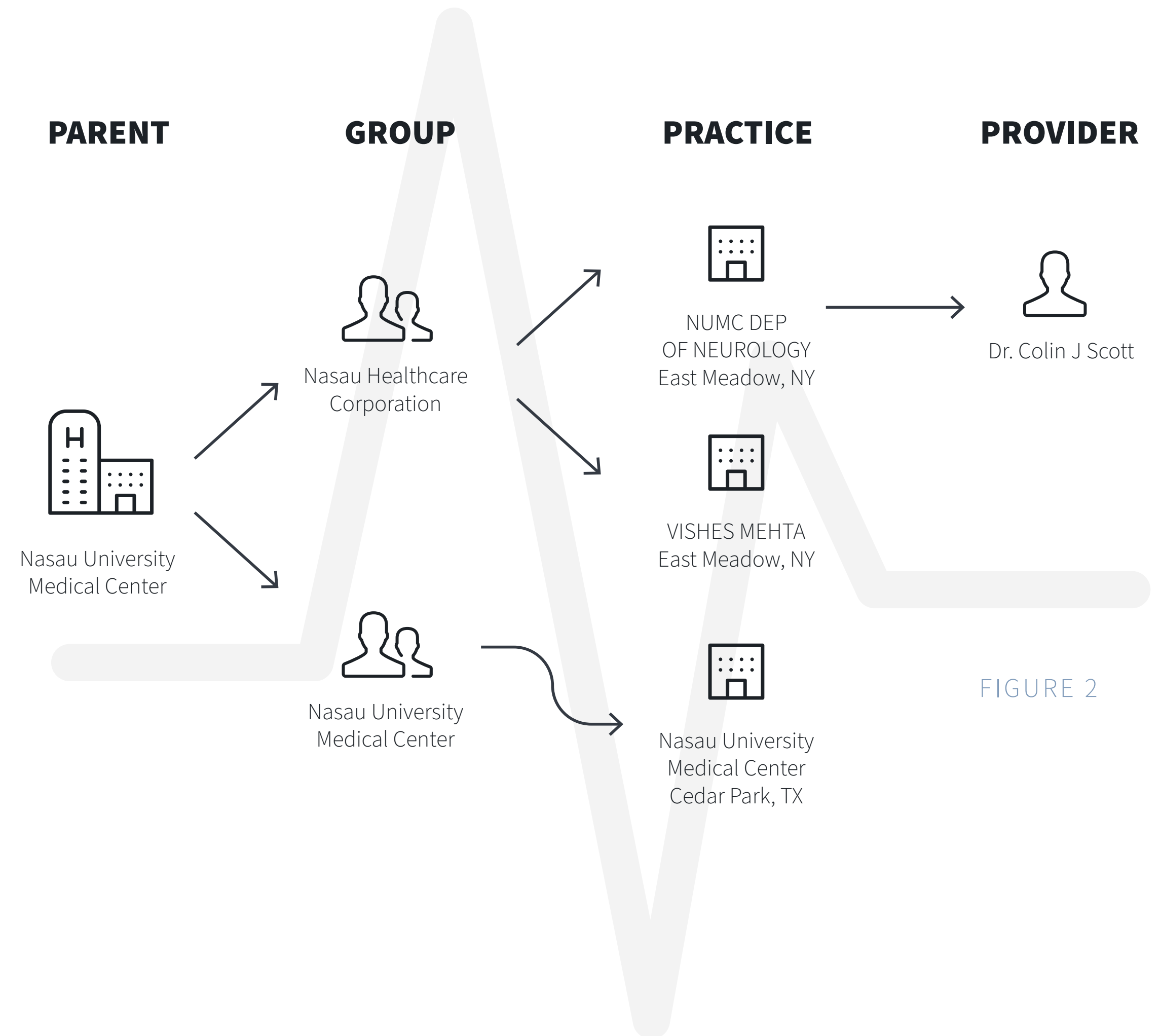

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Nasau University Medical Center

Nasau Healthcare Corporation

Nasau University Medical Center

NUMC DEP OF NEUROLOGY East Meadow, NY

VISHES MEHTA East Meadow, NY

Nasau University Medical Center Cedar Park, TX

Dr. Colin J Scott

FIGURE 2

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Investing in Next-Generation MDM for Patient and Provider Mastering

Organizations need a human-guided and cloud-native machine learning approach that can handle data volume and variety and accelerate the process of bringing new datasets together continuously to meet the time and regulatory challenges associated with the reality of modern patient and provider data.

On the patient side, machine learning generates continually-updated referential records for individuals and households that unify patient, hospital, and insurance records and update them on demand. Data from each source system is connected and matched across domains to generate persistent IDs for individuals in a rapid, scalable, and cloud-native process. Healthcare information and management professionals can provide direct feedback to the model to improve results. This human-machine feedback loop dramatically improves results and continues to

perfect results when given more data -- the opposite of a human-controlled rules-based system. The human subject matter experts are not data analysts but rather healthcare professionals and the patients themselves who understand the patient data's significance and care more than any other stakeholders to ensure that the data is as accurate and up-to-date as possible.

The result is a Next-Generation Master Patient Index synthesizing patient information from many sources into a complete 360-degree view of patients and families that can also be rapidly updated as new patient information is entered.

For providers, the role of customer mastering comes into play, ensuring accurate and up-to-date information is available for each provider in the network for each of their associations. It can also help weed out bad data

and false connections. With rules-based data mastering systems, the rules need to eliminate exceptions, express unique identity, and pass the concept to each system. The number of rules needed to manage ever-growing sets of data is unmanageable. Additionally, missing data, the temporality of data, and schema changes can easily break the system. The human-guided machine learning approach, however, is driven by a statistical model that takes into consideration the entire dataset. The data models are refined as more data is supplied, creating a system for constant improvements: the bigger the data sets, the more accurate the results.

Creating a Next-Gen Patient Mastering process is an investment in analytical and operational capabilities that will better serve patients, make healthcare organizations more efficient, and reduce overall costs.

Analytical benefits of Next-Gen Patient Mastering:

- Enriching data in a Master Patient Index by grouping individuals as a family or community demographics to better understand how they are accessing care, specifically to understand the needs of under-represented populations.

- Applying social determinants of health (SDoH), or other third-party data to power public health initiatives, including finding at-risk individuals and communities that can benefit from additional resources and preventative care.

- Facilitating efficient and frequent data exchanges with timely and accurate data, all while safeguarding patient health information and ensuring the lineage of patient data in each patient record and report meets governance requirements.

Operational benefits of Next-Gen Patient Mastering:

- Providing long-term, value-based care by monitoring longitudinal performance measures to improve the quality of care and reduce the cost of care by disincentivizing unnecessary treatments.

- Improving the patient experience by coordinating follow-up appointments and care, and identifying opportunities for preventative care and other interventions to reduce future hospitalizations across the many silos within the healthcare system.

- Reducing the likelihood of adverse events, mistreatment, and medical errors due to unknown patient data and interactions.

- Providing a 360-degree longitudinal view of a patient's entire medical history from the cradle to the grave, including military or information from other sources such as patient-generated data from modern health and wellness apps.

- Patients will also be able to augment their institutionally generated data with their own data generated from the many health and wellness apps and digital therapies that are coming to market by the dozens.

Putting Patient Mastering into Practice in at a Health Information Network Shared Services

One of the largest statewide Health Information Exchanges, was facing a challenge: the number of source systems across their network was growing and their existing, rules-based system couldn't keep up. And the system, which was difficult to maintain, was causing an impact on patient care. Instead, they needed a high-performance master person index solution that enabled them to consume data from multiple insurers and provider data sources, allowing them to create an admission, discharge, and transfer (ADT) data hub for national patient data within the Health Information Network.

The Health Information Exchange partnered with Tamr to help them achieve the economy of scale needed to handle nationwide numbers while providing them with an affordable total cost of ownership. Tamr's cloud-native, API-friendly, high-performance batch cleanse enabled the to construct a master patient index. And using low latency endpoints, they integrated it with the various patient management systems across their network.

As a result, the Exchange was able to better identify patients across systems. They also identified errors in data entry, which prompted an upstream review of the statewide data collection strategy and overall improvement in data quality. Using Tamr, the Health Information Network directly improved the care provided to the most vulnerable populations and demographics across the state.

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CHG Healthcare

CHG Healthcare Uses Provider Mastering to Generate Trusted Physician Records and Improve Staffing Strategies

CHG Healthcare, the nation's largest physician staffing company, struggled with data quality. Numerous departments across the organization entered physician data into the system but they did so inconsistently, causing multiple records for the same person. To spot these duplicate provider records, the team used a highly-manual, rules-based approach that was both time consuming and inefficient. To make matters worse, not only were they dealing with duplicate data, but the data itself was unreliable, too. Provider records often contained misspelled names, partial phone numbers, and other incomplete data points.

To improve the quality of their data and better meet patient needs, CHG Healthcare partnered with Tamr. Using Tamr's cloud-native, machine learning-driven solution, the team improved data accuracy and trust by reducing duplicate physician records by 66%. The cloud-native deployment enabled them to master millions of provider records in weeks. And human-guided machine learning substantially reduced manual data preparation.

As a result, CHG Healthcare is now able to develop staffing schedules that assign physicians to peak times in order to better meet patients needs. They've also reduced provider burn-out caused by over-assignment by ensuring each physician has a manageable patient load. Finally, CHG Healthcare is expanding the datasets they are mastering to include other health care providers such as nurses to further deliver optimal patient care.

It is more important than ever to engage with patient and provider data to find ways to improve patient outcomes, engage providers, and reduce healthcare costs. Organizations and agencies that invest in a modern data mastering solution see significant results and are further on their transformation and critically delivering better care for communities.

To learn more, **schedule a demo**.

Tamr

Tamr is the world leader data mastering. We accelerate business outcomes for leading organizations by powering analytic insights, boosting operational efficiency, and enhancing data operations. Tamr's cloud-native solutions offer an effective alternative to traditional Master Data Management (MDM) tools, using machine learning to do the heavy lifting to consolidate, cleanse, and categorize data. Tamr is the foundation for modern DataOps at large organizations including Industry leaders like Toyota, Santander, and GSK. Backed by investors including NEA and Google Ventures, Tamr is transforming how companies get value from their data.

Learn more at **tamr.com**