RHAPSODY

White Paper

Augmenting your EMPI solution with address verification technology

Using address verification and standardization to improve patient identification across the enterprise

Over the past decade, the healthcare industry has become an extremely data-rich environment. Electronic health records (EHRs), practice management tools, revenue cycle management systems, and patient-facing technologies have merged to create a complex web of digital data surrounding every step of the care process.

This wealth of information has unlocked opportunities for achieving many of the goals of the modern healthcare system, including improved patient outcomes and reduced costs.

But managing this deluge of data is a perennial pain point for provider organizations. With so much information available from so many different sources, even something as fundamental as matching an individual patient with his or her complete medical history can be an enormous undertaking.

Patient matching and identification problems happen frequently, despite efforts to verify and manage identities at regular intervals throughout the patient journey.

A landmark 2016 literature review by ECRI Institute found that patient identification errors occur at every point in the care process—from registration and order entry to diagnostics and surgery—leading to serious, costly, or even deadly occurrences such as wrong-site surgeries, major medication administration errors, and incorrect diagnoses.[1]

The problem not only endangers patient safety and an organization's reputation but contributes to needless waste and inefficiencies. The financial impact of patient misidentification is substantial—costing the average hospital $1.5 million and the U.S. healthcare system more than $6 billion dollars annually.[2]

The solution may lie in implementing proven tools as Enterprise Master Person Index (EMPI) platforms, in combination with address verification technology, to improve the patient identification and matching process.

Inaccurate patient identification costs the U.S. healthcare industry over $6 billion annually

Black book research
April 2018

Using an EMPI is an industry best practice essential for promoting patient safety and interoperability while helping healthcare enterprises map an individual's entire care journey, says Gevik Nalbandian, vice president of software engineering at Rhapsody.

As an automated, vendor neutral platform for enabling bidirectional access to patient information, an EMPI allows organizations to correctly identify and link health data spread across infinite disparate systems and sites of care. Using both probabilistic and deterministic matching algorithms to account for minor variations in patient data, an EMPI generates a single best record across the network.

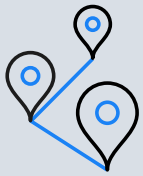
When integrated with address intelligence, an EMPI can deliver an even higher degree of patient data and matching accuracy.

Address intelligence refers to the validation, standardization and geocoding of a mailing address. Address verification technology ensures the correct address is entered and consistently formatted to help healthcare organizations proactively manage, detect and eliminate data quality issues. This means addresses are always accurate, standardized, and up to date for a trusted, reliable patient record.

An address can be verified in one of two ways: by capturing an address at the point of entry (front-end) or by cleansing, parsing, formatting and matching addresses in batch against an authoritative mailing database (back-end).

For providers looking to enhance the integrity of their analytic projects with "where," address intelligence adds a new dimension to EMPI capabilities. Insight into a patient's location can determine the geographical and social risk factors of a population, aid care interventions, and identify access to healthcare facilities.

Address Verification Technology



Automatically checks addresses, both incoming and existing, against authoritative mailing database

Standardizes address data to a universal format and updates askew data

Associates a latitude and longitude coordinate to any address location (geocoding and reverse geocoding)

Integrates seamlessly with Rhapsody® EMPI for superior data quality

Confronting the challenges of patient identity management

The healthcare system is becoming more interconnected and interoperable at the same time as patients are increasingly shopping around for services and seeking care from the providers who best suit their financial and clinical needs.

While these trends may have positive impacts on value and outcomes, they also make it more difficult to ensure that the right information for the right patient gets where it needs to go while remaining private and secure, explained Nalbandian.

"Patient identity management isn't just challenging because of the volume of data we have about each individual," he said."We also have to think about the multidirectional nature of how this information comes into and moves out of every unique facility."

"Many organizations rely on their EHRs or other technologies to manage and reconcile patient identity information, but these systems weren't really designed to do that. They just end up creating more silos than they break down."

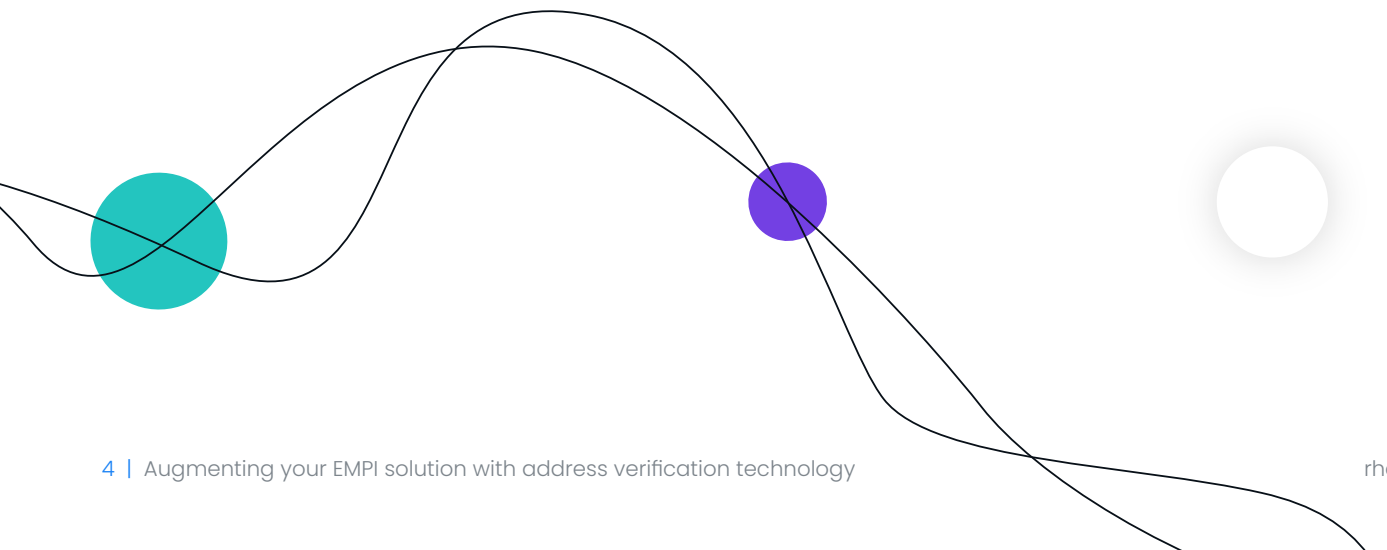
According to a 2018 report by Pew Charitable Trusts, EHR match rates within facilities are as low as 80 percent. When exchanging records outside the organization, match rates can be as low as 50—even when running the same vendor EHR.[3]

The result can be a medical error, disrupted workflow,a poor consumer experience or just enormous frustration, said Nalbandian.

"We've all had the experience of having to tell our birthday and home address to ten different people every time we get a service or pay a balance," said Nalbandian. *"Letters go to the wrong place; bills get lost in the mail. Clinical information falls through the cracks, which can lead to serious safety issues."*

"It's simply not going to cut it anymore in this consumer-centered environment where better outcomes, higher quality, and positive experiences are paramount."

Healthcare providers will need to take a more unified and collaborative approach to patient matching and identity management efforts, he suggested, no matter what technology they are employing for the task.



Organizations should be clear about which internal stakeholders are leading the project, what the ideal outcomes should be, and how to measure progress toward those objectives.

"In many health systems, the health information management (HIM) department leads the way with the primary aim of avoiding duplicated profiles," he said. "But we've also seen CIOs taking charge of patient matching, or CFOs if the issue is wreaking havoc in billing or revenue cycle."

Each of these groups can succeed in the leadership role as long as they are not working in isolation or in conflict with other parts of the organization. The goal for every organization should be to create consensus, certainty, and security around every individual, Nalbandian stressed.

"Instead of assembling bits and pieces as a patient moves through the system – or sometimes even after they have received a service – we need to get ahead of the problem," he said. *"A patient's identity has to arrive first so that the organization can be sure they have the correct data before they ever act on it."*

"We might be a little biased, being an enterprise master person index (EMPI) vendor, but we really believe that you need to treat a patient identity as something separate and unique that overlays your architecture and ties all these systems together so that you and your patients can have confidence in your data matching abilities."

Adding address intelligence to the patient identity management toolkit

Integrating address intelligence is one way to extend one's EMPI and reliably identify individuals.

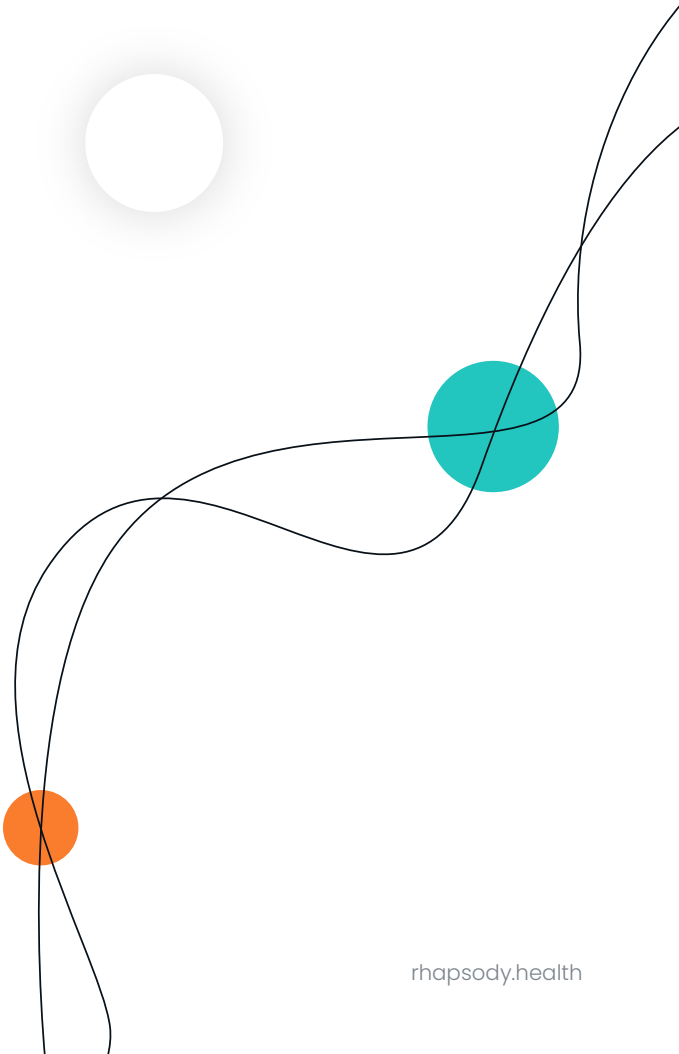
While biometrics, third-party data and blockchain are still maturing in the identity management market, address verification technology is primed to support widespread patient data integrity, according to Nalbandian.

"Address intelligence, namely address standardization, verification and geocoding, is the most laudable technology for extending EMPI performance and improving data quality," he said.

Address intelligence software standardizes, verifies, parses and resolves residential and business addresses according to such postal standards as U.S Postal Service (USPS), Royal Mail and Canada Post. Additionally, it associates or latitude and longitude coordinate, to any address location.

Standardization of the address corrects spelling errors, adjusts abbreviations, adds missing information (such as zip code or suffix), and resolves appropriate capitalization so that the address is converted to the appropriate format.

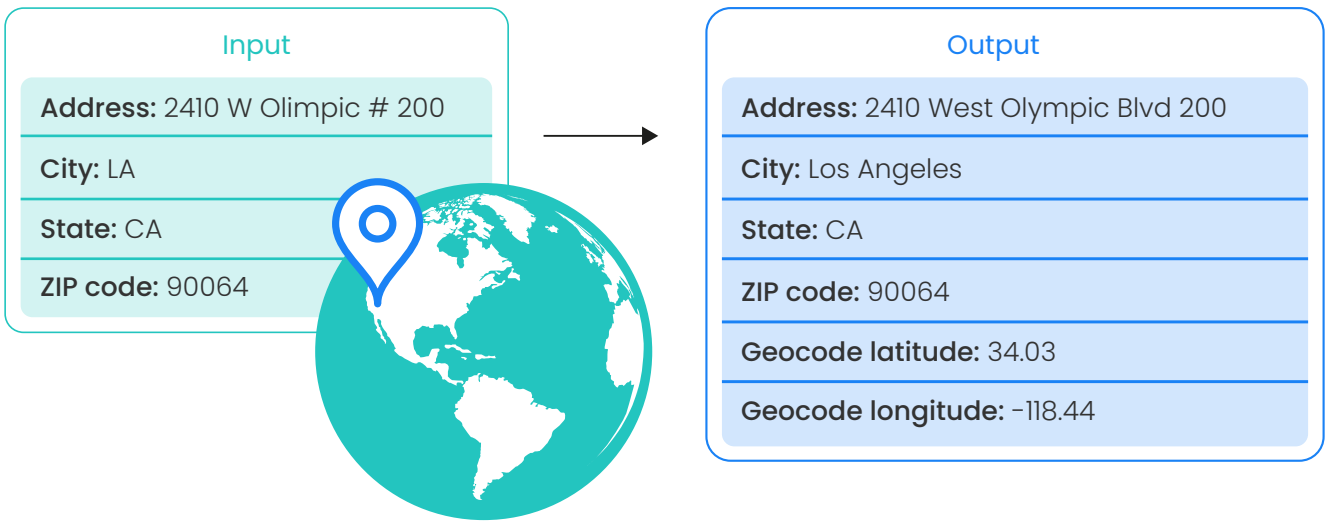
Verification of the address involves comparing a given address against an official mailing database, such as the USPS, and matching the record between the two. If a match is found, address verification software will correct the address, verify it, and return a valid address. If there is a USPS-recognized address that matches the address given, the needed adjustment is made. The technology can even verify if USPS in fact delivers mail to a particular address.



Geocoding of the address refers to the geographical latitude and longitude coordinate that is automatically generated during the data enhancement process. It can also identify locations nearest to a latitude and longitude coordinate, called reverse geocoding, to perform location-based services. This could significantly benefit providers and patients in cases of in-network physician searches and referrals.

As an individual's precise location becomes more important in helping organizations tackle social determinants of health (SDOH), address intelligence can be useful for identifying populations at risk for disease, natural disaster, poverty, or poor water purity. By identifying these hot spot populations, organizations can apply interventions to areas that will have the most impact on the greatest number of at-risk patients.

How it works

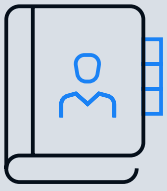


Rhapsody EMPI and address verification

Plug-and-play address verification as part of the market-leading Rhapsody EMPI can:

Batch process more than 3 million records per hour while appending geocode coordinates to those records.

Reduce data entry errors at the point of capture by more than 20%.



Verify, parse, correct and format addresses for over 245 countries and territories.

Providers can use address intelligence in conjunction with their EMPI to standardize all patient addresses, verify mailing lists and geocode a patient's exact coordinates to help with referrals or locate providers closest to them that are covered under their insurance. Further, with the right address format, providers can be sure they are not unnecessarily creating duplicate patient records. In fact, a study published in the May 2019 issue of the Journal of the American Medical Informatics Association (JAMIA) found that standardizing patient addresses using the USPS format in EHRs improved match rates by up to 3 percent.[4]

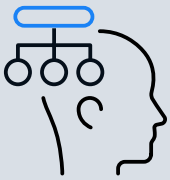
"When combined with other demographics for patient matching, it ensures address information is consistently formatted thereby avoiding data entry errors and record duplicates," said Nalbandian.

The technology can enable front-end, real-time address capture as well as backend batch address verification and enhancement. Address intelligence offered as part of the Rhapsody EMPI solution can batch process more than 3 million records per hour while appending geocode coordinates to those records. It also reduces data entry errors at the point of capture by more than 20 percent.

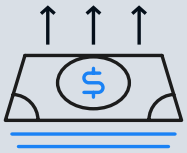
In the healthcare setting, this combined and centralized approach to identity management improves patient data quality while simultaneously strengthening the ability to protect against fraud by validating patient identities across participating members of the care continuum.

EMPI + address verification —a powerful combination

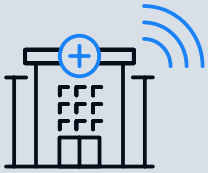
Superior data quality



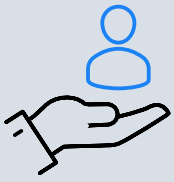
Improved patient identification



Enhanced billing processes



Greater patient communications



Better consumer experience

Conclusion

As the healthcare system draws closer together around shared goals of quality, interoperability, and patient safety, providers will need to start employing additional strategies for patient identity management.

According to an IDology 2019 Fraud Report, 80 percent of companies believe accurate address validation is *"extremely or very important"* to the identity verification process.[5]

While address intelligence is still a relatively new methodology in healthcare, interest among organizations, particularly state health information exchanges (HIEs), is growing.

In the shift away from fee-for-service, savvy healthcare leaders are realizing they will need to understand where their patients are and the conditions that surround them to care for them effectively. Address intelligence can help organize patients, providers and geographically referenced data to reveal the relationship of location to people, events, facilities, and resources. This organization can be used for target interventions or to inform strategies for population health management and social determinants.

By bringing together high-quality address data with one's EMPI, organizations will be able to identify and care for patients faster and more effectively.

References

1. ECRI Institute PSO Deep Dive: Patient Identification, ECRI Institute 2016, https://www.ecri.org/patient-identification-deep-dive.
2. Improving Provider Interoperability Congruently Increasing Patient Record Error Rates, Black Book Survey, April 12, 2018, https://www.blackbookmarketresearch.newswire.com/news/improving-provider-interoperability-congruently-increasing-patient-20426295.
3. An Industry Roadmap for Provider Data, The Provider Data Action Alliance, Pew Charitible Trusts, October 2, 2018, https://www.pewtrusts.org/en/research-and-analysis/reports/2018/10/02/enhanced-patient-matching-critical-to-achieving-full-promise-of-digitalhealth-records.
4. Evaluating the effect of data standardization and validation on patient matching accuracy, Journal of the American Medical Informatics Association, Volume 26, Issue 5, March 8, 2019, https://academic.oup.com/jamia/article-abstract/26/5/447/5372371.
5. Seventh Annual Fraud Report, IDology, September, 2019, https://ww2.idology.com/seventhannual-fraud-report.

About Rhapsody

Rhapsody partners with healthcare organizations around the globe delivering its adaptable Interoperability Suite to reliably connect, classify, and clean data. Rhapsody health solutions power the applications and workflows that improve clinical, operational, and financial outcomes today while helping teams respond to and prepare for changes on the horizon. Rhapsody is committed to empowering people throughout the healthcare ecosystem, from specialty clinics to large care networks, from public health to health technology, and everything in between.

For more information or to request a demo, visit rhapsody.health.

Let's talk.