OTR

JOURNAL OF THE ACADEMY OF LIFE UNDERWRITING

June 2023
Volume 39 Number 2
www.ontherisk.com

ACADEMY OF LIFE UNDERWRITING
www.alu-web.com

OTR is a benefit of membership in

AHOU
Advancing the Underwriting Profession
www.ahou.org

and

CIU
www.ciu.ca

IN THIS ISSUE

ISSN 0885-4416

ELECTRONIC HEALTH RECORDS – ENABLERS OF THE NEXT MAJOR LEAP IN LIFE UNDERWRITING

Andy Kramer, FLMI, ACS
VP, U/W Risk & Innovation
M Financial
Lutz, FL
andy.kramer@mfin.com

Paulo Pinho, MD, DBIM
VP & MD of Innovation
Availity Clinical Solutions
Union, NJ
paulo.pinho@availity.com

Executive Summary *The life insurance industry historically has been seen as a slow adopter of technological innovations. Contrary to popular opinion, the industry has undergone a period of dynamic change over the past decade. Among the hardships of the COVID-19 pandemic, traditional underwriting sources became difficult to obtain, forcing carriers to adopt the emerging data source of electronic health records (EHR) to continue writing new business. These new data sources, coupled with leading edge artificial intelligence (AI), have the potential to dramatically reshape life insurance underwriting. They must be used as new tools with slightly different uses, unique advantages and limitations. This article is the first of a three-part series to define and explain the background of the new data sources and some of the value-added services that can maximize their value and lay out a potential roadmap for carriers to make the best decisions for their businesses and hopefully avoid costly missteps.*

Introduction

The life insurance industry historically has been seen as slow to adopt technological innovations and overly reliant upon antiquated legacy systems. Contrary to popular opinion, the industry has undergone a period dynamic change over the past decade. Among the hardships of the COVID-19 pandemic, traditional underwriting sources became difficult to obtain, forcing carriers to adapt and adopt the emerging data source of electronic health records (EHR) to continue writing new business. These new data sources, coupled with leading edge artificial intelligence (AI), have the potential to dramatically reshape life insurance underwriting.

These new data sources are different from the traditional sources of underwriting information. They cannot be viewed through the same lens with the same expectations as traditional tools. They must be used as new tools with slightly different uses, unique advantages and limitations. This article is the first of a three-part series to define and explain the background of the new data sources and some of the value-added services that can maximize their value and lay out a potential roadmap for carriers to make the best decisions for their businesses and hopefully avoid costly missteps.

Medical Underwriting Data Sources

Attending Physician Statement

The attending physician statement (APS) has long been considered the gold standard to corroborate a life insurance applicant's medical history. While advancements in medical therapies and impairment-specific specialization have improved overall patient care, the job of the life insurance underwriter has become increasingly complex.

Each one of these providers generates a different APS that is received by carriers in PDF format to incorporate into their underwriting workbench. This process is both expensive (an average of about $75 but can exceed $200) and time-intensive (it takes weeks to receive them and takes hours, if not days, to have an underwriter and/or a medical director review them to incorporate content into workbench notes to enable decision-making).

In addition to the time and financial burden required, APSs present the challenge of human interpretation. The underwriter's analysis can be inaccurate or be inconsistent with the clinical intent of the provider. Additionally, the accuracy of the interpretation may

vary depending on an underwriter's workload, competing priorities and expertise. These APSs can be the subject of applicant misrepresentation or omission, as the client has control over which health care providers they disclose during underwriting.

Over time, carriers have sought to automate and enhance underwriting review. They have looked beyond information trapped in PDF documents toward material and transactional data elements that could expedite offer decisions consistently. Prescription drug reports, medical claims and lab reports have largely served as the foundation of this automation.

Prescription Drug Reports (Rx Reports)

Prescription drug reports (Rx reports) were among the first forms of electronic data primed to drive automation. They were introduced to the life insurance industry in the early 2000s. The adoption curve was flat primarily due to low hit rates. By the late 2010s, hit rates exceeded 80% and their value to decision making accelerated adoption within the industry.

With increased adoption, vendors began adding risk scores to enhance and expedite qualitative and quantitative assessment by carriers, as they merged these scores with other internal quantifiable measures of risk. The sources of these Rx reports are retail pharmacies, pharmacy benefit managers and prescription insurers. They are generally cost-effective at $10 and $20 per Rx report, with an additional charge for the value-added scoring.

Over time, vendors have sought to differentiate with additional value-adds like clinical laboratory tests and medical claims data to provide greater discernment of medical conditions that may drive prescription patterns. For example, identifying sudden increase in a prednisone prescription or dosing could represent a bad case of poison ivy or poorly controlled asthma or rheumatism. Medical claims codes provide insight into the underlying reason for the prednisone usage, and clarify morbidity and mortality risk.

Medical Claims Data

Medical claims data has been available to support underwriting for the last half-decade. It contains medical information that supports billing by medical providers. While it does offer diagnosis codes typically presented in the International Classification of Disease (ICD-10) format and procedure codes presented in Current Procedural Terminology (CPT) codes, it lacks substantial granularity to truly support risk decision making.

Additionally, providers seek to document in ways that justify billing and approval of procedures, which at times creates discordance between what is entered in claims and what is further qualified in medical documents. Nonetheless, medical claims data provides a fairly accurate inventory of conditions and procedures that are part of an applicant's journey. When combined with other data sets, the clinical picture of an applicant becomes clearer.

It is the discordance between medical claims, pharmacy data, laboratory results and clinical data that provides the greatest insights about the difficult to quantify human behavioral aspects. The presence of a diabetes diagnosis in claims and a series of normal hemoglobin A1c scores with the absence of oral or injectable medications in the clinical record may serve as justification that the code was entered for lab test approval. In situations where conflicting information is uncovered, critical thinking by an underwriter is critical.

Another example is the presence of a historical alcohol misuse entry in the problem list that may not make it to the encounter diagnosis for billing, which may capture unintentional misrepresentation or, perhaps, even collusion between an applicant and their doctor to help clean sheet a medical review. This claims information, as stated previously, has been added by suppliers of pharmacy data and lab data to help provide more clinical insight. Medical claims data costs are in line with Rx reports and can be bundled with Rx for a marginal cost.

Clinical Laboratory Results

Clinical laboratory test results, both from the underwriting requirements, as paramedical examiner collected blood and urine, and longitudinally from the applicant's clinical visits in the outpatient and inpatient settings, are increasingly being used among US carriers. Additionally, companies that provide these results are including medical claims information and risk scores to improve more facile decision making by underwriters, and can do so in cost conscious manner. Moreover, reinsurers are taking this longitudinal data and providing thoughtful and value-added risk scores to raw laboratory data to help differentiate themselves.

Electronic Health Records (EHR)

In 2009, the Health Information Technology for Economic and Clinical Health (HITECH) Act was passed on the premise that paper medical charts contributed to care gaps and challenges with data exchange between health care stakeholders.[1,2]

HITECH provided a certification of Meaningful Use for both electronic health record vendors and providers who deploy them. This initiative was a cornerstone of interoperability and data transparency. It also incentivized vendors and providers to create and use electronic record systems meaningfully.

While HITECH provided the path to standardization of clinical data exchange, it also generated the opportunity for many vendors to enter the space and made it increasingly crowded. Hundreds of vendors evolved and began to establish relationships with hospital systems and providers.

Meaningful use for an EHR consists of:

1. Health-related information about patients, including demographic and clinical health information.
2. The capacity to provide clinical decision support.
3. Support for physician order entry.
4. Capturing and querying information relevant to health care quality.
5. Exchanging and integrating electronic health information from other sources of impactful data.[3]

The Office of the National Coordinator for Health Information Technology (ONC) chose the Consolidated Clinical Data Architecture (C-CDA) format, an XML standard, as the best way to help with interoperability within and between electronic health records. The C-CDA organizes data through specific templates with unique object identifiers (OIDs) in a nested structure.[3]

There are different document types in this format, namely Continuity of Care Document (CCD), Progress Note, Procedure Note or Referral Note, to name

Table 1. Some Common Coded Vocabularies. *NOTE: This is not an exhaustive list of terminologies, rather those of greatest importance to life insurance underwriting.*

Vocabulary	Definition	Number of Codes/Terms	Typical Domains
SNOMED-CT – Systematized Nomenclature of Medicine Clinical Terms (www.snomed.org).	The most comprehensive and precise, multilingual health terminology in the world. It contains diagnoses, problems, clinical symptoms and signs, results.	340,000	Problems, exams, review of symptoms, diagnoses, results, narrative text, social history and family history.
ICD10 – International Classification of Diseases (www.cms.gov/Medicare/Coding/ICD10).	This is a medical classification system created for the World Health Organization (WHO) to capture encounter diagnoses, diseases, complaints, social circumstances and external causes of injury.	70,000	Problems, diagnoses and social circumstances.
CPT – Current Procedural Terminology (www.ama-assn.org/ama-one/cpt-current-procedural-terminology).	Describe the medical procedures and services available to patients.	10,969	Procedures
NDC – National Drug Code (www.fda.gov/drugs/drug-approvals-and-databases/national-drug-code-directory).	A unique 10- or 11-digit code assigned to each medication in the US Federal Food and Drug, Drug and Cosmetic Act.	252,355	Medications
Rx Norm (https://lhncbc.nlm.nih.gov).	A normalized list of clinical drugs and links to other vocabularies used in pharmacy management and drug interaction software.	10,429 valid ingredients	Medications
LOINC – Logical Observation Identifiers Names and Codes (www.loinc.org).	A clinical terminology set that is critical to laboratory tests orders and results.	55,000	Results, vitals

a few. Beyond simple location in the XML, providers of data were required to conform with what clinical data should be present and how to best represent it.

The ONC assigned descriptive vocabulary languages to clinical data elements. For example, RxNorm became the vocabulary standard for medication transaction, and SNOMED CT and ICD10 became the vocabulary for problems and diagnoses (see Table 1, previous page). With consistent structure and common terminology, receiving systems could more easily parse C-CDAs based on template OIDs and vocabulary sets.[3]

Clinical notes in this format can be easily exchanged with carriers (Figure 1). As part of Meaningful Use and subsequent legislation, EHRs are required to transact these XML files to patients who request transfer of data.[3]

To make representations of these XML codes legible to users of such data, each EHR vendor has a proprietary "style sheet" capable of presenting the data in a legible format to nontechnical people. It is effectively an HTML representation of the XML document (Figure 1).

Data vendors who transact data from EHR organizations will often also have a personalized "style sheet" that enables presentation of EHR information agnostic of the source of the document in a way that can be easily read by someone (Figures 2 & 3).

Figure 1. Typical XML Output of a Continuity of Care Document (CCD).

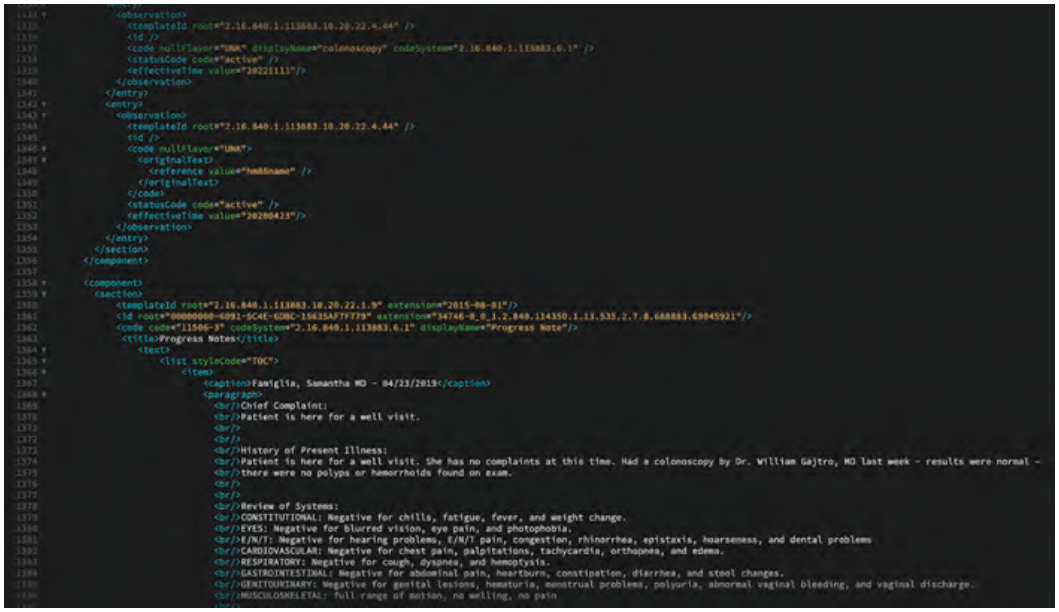


Figure 2. Typical EHR Stylesheet on a Fictitious Person.

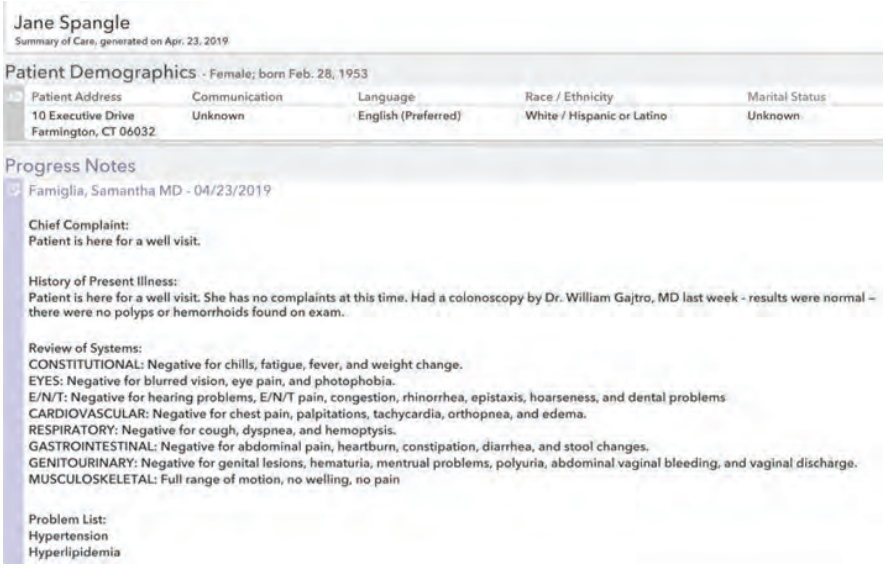
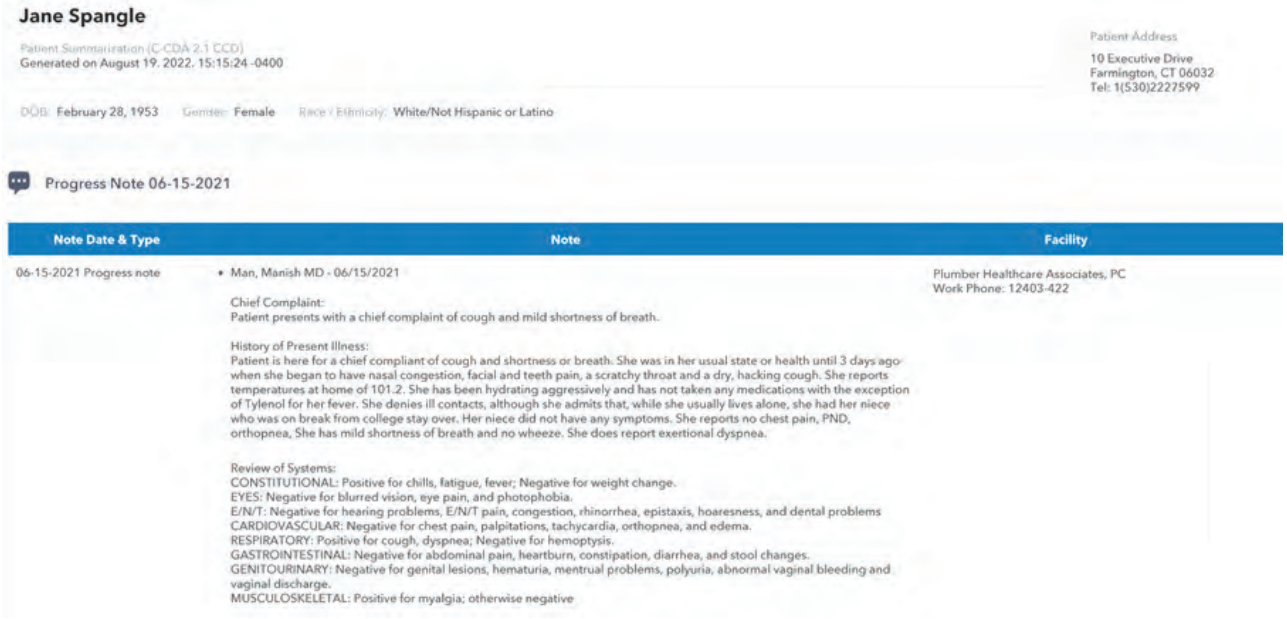


Figure 3. Typical Data Vendor Stylesheet on a Fictitious Person and Physician.



Jane Spangle

Patient Summarization (C-CDA 2.1 CCD)
Generated on August 19, 2022, 15:15:24 -0400

Patient Address
10 Executive Drive
Farmington, CT 06032
Tel: 1(530)2227599

DOB: February 28, 1953 Gender: Female Race / Ethnicity: White/Not Hispanic or Latino

Progress Note 06-15-2021

Note Date & Type	Note	Facility
06-15-2021 Progress note	• Man, Manish MD - 06/15/2021 Chief Complaint: Patient presents with a chief complaint of cough and mild shortness of breath. History of Present Illness: Patient is here for a chief compliant of cough and shortness or breath. She was in her usual state or health until 3 days ago when she began to have nasal congestion, facial and teeth pain, a scratchy throat and a dry, hacking cough. She reports temperatures at home of 101.2. She has been hydrating aggressively and has not taken any medications with the exception of Tylenol for her fever. She denies ill contacts, although she admits that, while she usually lives alone, she had her niece who was on break from college stay over. Her niece did not have any symptoms. She reports no chest pain, PND, orthopnea, She has mild shortness of breath and no wheeze. She does report exertional dyspnea. Review of Systems: CONSTITUTIONAL: Positive for chills, fatigue, fever; Negative for weight change. EYES: Negative for blurred vision, eye pain, and photophobia. E/N/T: Negative for hearing problems, E/N/T pain, congestion, rhinorrhea, epistaxis, hoaresness, and dental problems CARDIOVASCULAR: Negative for chest pain, palpitations, tachycardia, orthopnea, and edema. RESPIRATORY: Positive for cough, dyspnea; Negative for hemoptysis. GASTROINTESTINAL: Negative for abdominal pain, heartburn, constipation, diarrhea, and stool changes. GENITOURINARY: Negative for genital lesions, hematuria, mentrual problems, polyuria, abnormal vaginal bleeding and vaginal discharge. MUSCULOSKELETAL: Positive for myalgia; otherwise negative	Plumber Healthcare Associates, PC Work Phone: 12403-422

Patient Portal Data

In addition to generating standards for data exchange, the Affordable Care Act sought to drive patient engagement, believing that an engaged consumer would contribute to better decision making, reduced costs and improved outcomes.[2] Such engagement could be sparked by a patient's ability to view, download and transmit their electronic health data. Individual EHRs created patient portals to allow for this access.[4]

One limitation with patient portals is that providers decide what clinical elements to share with patients. If a provider does not want to enter a suspected condition for fear of legal repercussions or patient dissatisfaction, such information could be omitted.

For underwriting purposes, this creates a problem if patient portals are missing key pieces of clinical information. While patient portals do provide the advantage of quick and inexpensive access to data without much administrative effort from a Health Insurance Portability and Accountability Act (HIPAA) standpoint, an applicant still must grant access to the data provider.

This has proven to be a sizeable hurdle in the insurance purchase process. The challenge occurs from:

1. Producers unwilling to ask their clients to grant access to the patient portal data.
2. Clients resistant to allow access.
3. Clients technologically challenged to facilitate log in.

Table 2 (next page) demonstrates a use case for how the elements of a patient's medical history will be reported in the form of the medical data standards, the implications of the condition for underwriting, and the likelihood each medical record data source will contain them.

Mr. Smith, a 45-year-old male executive, applies for life insurance and is asked to submit his entire medical history over the last 5 years. Mr. Smith submits an APS from an urgent-care center for episodic care in his home state of New Jersey. He omits that he has a medical provider in a different state whom he visits frequently for his routine care. The APS includes:

- *A problem list*, which contains a medical history of hypertension.
- *Medications*, which includes a prescription for amlodipine 5 mg to treat the hypertension.
- *Chief complaint*, which documents a head laceration due to a fall he sustained in his backyard.
- *Review of systems*, which documents a negative review of symptoms and signs with the exception of the head laceration.
- *Vitals signs*. His vital signs, including blood pressure, are normal.
- *Physical exam*, which is considered normal and routine, except for the head laceration.
- *Assessment or encounter diagnosis*. The head laceration is documented as "laceration without foreign body of other part of head, initial encounter."
- *Treatment plan*, which contains a documented procedure note to treat the head laceration.
- *Additional narrative text*. Notes include the following: "While suturing Mr. Smith, the intense smell of alcohol was noted on his breath and in the room. No other stigmata of alcohol use/abuse were noted on history or physical exam."

The APS would likely lead an underwriter to obtain more information, namely the diagnosis history, the medication list, the presence of a fall and the smell of alcohol.

With a relatively innocuous application documenting only a visit to urgent care for episodic problems, an underwriter may not have even gotten this information to begin a more exhaustive search.

What would that visit alone generate in terms of claims data, Rx check, patient portal data and electronic clinical data?

1. *Claims data*: Claims data from the laceration would include the ICD-10 diagnosis code (S01.81XA) and the CPT procedure code (12013; Simple/Superficial-Scalp, Neck, Axillae, External Genitalia, Trunk, Extremities, 2.6 cm to 5 cm).
2. *Rx check*: May show amlodipine in either NDC or RxNorm format if the New Jersey provider ever refilled the medication.
3. *Patient portal data*: Would only capture a general summary of this information for patient consumption and may omit key information from the review of symptoms and physical exam and exclude documentation of the alcohol concern. It would contain the diagnosis and treatment of the head wound, along with follow-up instructions.
4. *EHR data*: Would capture all of what was present in the APS, as well as the coded standards ontologies that supported claims and Rx checks data.

The aggregation and analysis of all these data sources would highlight key pieces of omission or frank misrepresentation in their discordance around the diagnosis history, the medication list, the head injury and the smell of alcohol.

Health Information Exchange Data

Prompted by the HITECH Act, medical providers have widely adopted EHR technology in their offices, with about 90% of them using an EHR to chart patient information. In addition, 92% of health care consumers live within the catchment area of a Health Information Exchange (HIE).

HIEs were created at the regional and state level to allow health care professionals and patients to access and share medical information electronically in a secure and contextual manner. HIEs typically aggregate data from various sources, including hospital messages, C-CDA documents from EHRs, medical providers and hospital systems, as well as social data, with the goal of achieving total person care insight. HIEs typically receive data in raw formats and either transact them with data users in raw form or after some degree of standardization to national standards.

There are roughly one hundred different HIEs, which can present a challenge to truly obtaining the full picture of a patient's care. A patient may have a provider who sends data to one HIE, but may have a hospital admission that reports to a different HIE.

Table 2: The Story of Mr. Smith.

	Medical Risk	Claims	Rx Check	Patient Portal	APS	Electronic Healthcare Data
Hypertension (SNOMED)	+++	●	●	●	●	●
Amlodipine (Rx NORM)	++ (evidence of treatment important)	●	●	●	●	●
CC - "Head Laceration" (SNOMED)	+	●	●	●	●	●
HPI Narrative (some SNOMED)	+++ (in the negative)	●	●	●	●	●
ROS (some SNOMED)	+++ (in the negative)	●	●	●	●	●
Vitals (LOINC)	+ (the fact they are normal)	●	●	●	●	●
Physical Exam (some SNOMED)	+ (the fact it is normal)	●	●	●	●	●
Head Laceration (ICD10)	++	●	●	●	●	●
Laceration Repair (CPT)	+	●	●	●	●	●
Plan of Care (SNOMED)	+ (evidence of medical follow up)	●	●	●	●	●
"The smell of alcohol" (Unstructured)	+++++	●	●	●	●	●

● Likely documentation in that source ● Possible documentation in that source ● Likely undocumented in that source

This is often the case when patients receive medical care when traveling, for example, a person living in New York requires medical care while on vacation in California. The data generated in New York and California are both necessary to capture the patient's complete care journey. Thus, a strategy for accessing both HIE data sets is required for a carrier to get the complete picture.

Recent legislation around the Trusted Exchange Framework and Common Agreement (TEFCA) is intended to improve the exchange of electronic health information across distinct HIEs. TEFCA establishes a framework for the creation and administration of Qualified Health Information Networks (QHINs) to ensure that this data is transmitted responsibly and accurately for true health care interoperability. QHINs are data aggregators that connect with one another to allow for data exchange around the country.[5]

The life insurance industry often views EHR data as disadvantaged as compared with APSs because of low hit rates. This is not a challenge of EHRs, given that EHRs contain the same information present in APSs. The challenge is that health care consumers rarely receive care in a single setting. Patient data can be fragmented across provider offices, hospitals, information systems and even within the same HIEs.

While creating relationships with individual HIEs, EHRs or health systems is a fantastic regional strategy, it may limit the full picture of the entire medical journey. To this end, carriers who are advanced in their data acquisition strategy have partnered with vendors (data aggregators) that have relationships with national and regional HIEs to access the most comprehensive and longitudinal patient data.

This is the ideal way to improve hit rates beyond the 50% mark that encumbers the life insurance industry today. HIE data can be costly ($25 to $40 range per applicant/document), but acquiring data that represents the sum of patient experiences for a given applicant is critical and could make this spend worthwhile.

Electronic Health Record Data

EHR data, either provided directly from an EHR, an HIE or a data aggregator, represent data collected as part of visits to hospitals, clinics and doctor's offices. These records are generally the most complete and closely resemble an APS; recall that earlier in the article, APSs are the "style sheet" renderings of XML documents in C-CDA format that have been printed to PDFs. As stated earlier, there is a need to ensure that all aspects of the patient care journey are captured, or a carrier suffers the hit-rate fate.

There are a couple of other EHR challenges. Despite Meaningful Use, true interoperability remains elusive. The HITECH Act created a market for hundreds of EHR solutions, which has presented the challenges noted above.

Despite the creation of national data standards, the nuances of health care data result in variability in data acquisition across providers and technology. For example, EMR A and EHR B do not speak the same language, and two separate implementations of EMR A may not speak the same dialect, even within the same hospital.

This creates gaps in a patient's story. Imagine reading a book that begins in English, switches to French, and then toggles between French dialects in Quebec and France.

This incongruence weighs down voluminous EHR data with a considerable amount of redundant information, increasing the time and decreasing the efficiency of underwriters. Solutions that sit downstream from the data acquisition can translate the "language" of different EHR systems, generating true and accessible semantic interoperability.

A third challenge beyond hit rates and semantic interoperability resides with organizational change management and adoption. This will be discussed in the subsequent articles. Innovation in this regard is less about the underlying technology and more about the extent that it enables a seamless and meaningful user experience.

Conclusion

APSs have been used by the life industry for decades, but they represent a static data asset that requires underwriting and medical director interpretation, inference and transcription to fit into workflows.

New sources of medical data have emerged over the past 20 years that lend themselves to greater determinism and less "reading between the lines" on the part of underwriters. These new data sources have driven dramatic change in the transaction of medical data over the last decade, catalyzed by the Affordable Care Act.

These data sources have and will continue to be the foundation of change in the life insurance industry, leading to improved underwriting in speed, consistency, efficiency, personalization and effectiveness.

EHR records are different than traditional APSs, so the strengths and weaknesses of each must be considered. EHR implementation needs to happen with the understanding that they are different and therefore need to be deployed differently in production for the best results. Moreover, multiple data sources increase the likelihood of uncovering conflicting information and discordance, requiring the judgment of a knowledgeable underwriter with strong critical thinking skills.

The next two articles in this series will address considerations of EHRs for current usage, the implementation of electronic health records, and predictions for how this will change future underwriting algorithms and workflows. The articles will discuss how electronic health data will retool the underwriting process and help prepare underwriters and medical directors for a data-driven future. The articles will explore what additional solutions, technologies and advances can enhance use of electronic health data integration.

Author Note: All examples are hypothetical and for illustrative purposes only. Actual results will vary. Experiences of clients with life insurance products will depend on their unique facts and circumstances.

Notes

1. US Department of Health & Human Services. (16 June 2017). HITECH Act Enforcement Interim Final Rule. www.hhs.gov/hipaa/for-professionals/special-topics/hitech-act-enforcement-interim-final-rule/index.html.
2. US Department of Health & Human Services. (17 March 2022). About the Affordable Care Act. www.hhs.gov/healthcare/about-the-aca/index.html.
3. Federal Register: The Daily Journal of the US Government. (12 July 2010). Health Information Technology: Initial Set of Standards, Implementation Specifications and Certification Criteria for Electronic Health Record Technology. www.federalregister.gov/documents/2010/07/28/2010-17210/health-information-technology-initial-set-of-standards-implementation-specifications-and.
4. The Office of the National Coordinator for Health Information Technology. (9 August 2022). Health IT Legislation. www.healthit.gov/topic/laws-regulation-and-policy/health-it-legislation.
5. The Office of the National Coordinator for Health Information Technology. (8 February 2023). Trusted Exchange Framework and Common Agreement (TEFCA). www.healthit.gov/topic/interoperability/policy/trusted-exchange-framework-and-common-agreement-tefca.

About the Authors

Andy Kramer, FLMI, ACS, has over 30 years of experience in many facets of the industry, from full underwriting at a primary carrier, direct-to-consumer simplified underwriting and reinsurance underwriting. Throughout his career he has focused on process improvement activity, which includes obtaining his Six Sigma Master Black Belt certification at GE and overseeing two major underwriting system implementations. Andy has an MBA from the University of Missouri-Kansas City and a BS from Saint John's University (MN).

Paulo Pinho, MD, DBIM, is currently the Vice President & Medical Director of Innovation for Diameter Health (now Availity Clinical Solutions). He provides clinical expertise and thought leadership on existing and emerging regulations, quality measures, health care data standards and technologies relevant to Availity's offerings. Prior to his current role, he was the Chief Medical Officer at Optimum Life Reinsurance and the Lead Medical Director for Prudential International Insurance responsible for global innovation in Asian and Latin American markets. Paulo has practiced medicine for close to 20 years. He is dual board certified in Internal Medicine and Pediatrics, and is a Diplomate of the Board of Insurance Medicine. He remains clinically active and is an active volunteer leader with the Arthritis Foundation and with MyLifeSpeaks, an organization that provides care at a village-based clinic near Leogane, Haiti. He enjoys running and has completed a half-marathon in all 50 states.