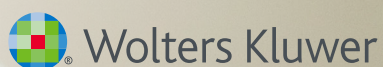


WHITEPAPER

How a Clinician- Friendly Approach to NLP Produces Results That Make a Difference

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THE IMPORTANCE OF QUALITY DATA

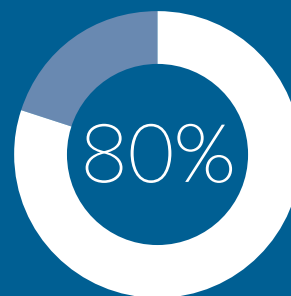
Clinicians rely on data to provide a comprehensive view of a patient's health. While much of this data lives in the electronic health record (EHR), some come from other clinical systems, insurance claims, new medical research, and even from patients themselves.

Unfortunately, simply having access to data isn't the same as being able to effectively use the data. Roughly 80% of healthcare data is considered unstructured, regardless of its source. What's more, data sources are often segregated, and the cost and complexity of integration give healthcare organizations little incentive to organize clinical data.¹

The presence of disparate and unstructured data has a negative impact on the care experience as well as the revenue cycle.

More recently, advanced technology such as natural language processing (NLP) has emerged as a potential solution to addressing these challenges by augmenting the review of large, unstructured data sets. Most NLP technology focuses on extracting information from large data sets, and while this is valuable in a clinical setting, it's not enough.

- Physicians spend **more than 16 minutes per individual** care encounter in the EHR, largely because they are searching for hard-to-find data.²
- Physicians also spend **close to six hours per day in the EHR** due to **documentation challenges**, including nearly 90 minutes after clinical hours.³
- It can take physicians up to **20 minutes** to respond to a **single query** from a clinical documentation improvement or coding specialist.⁴
- Inpatient coding productivity **declined** approximately **30%** amid the transition from ICD-9 to ICD-10; nearly half of coders complete **two or fewer charts per hour**.⁵
- The inability to effectively share data can lead to **delays in care**, which contributes to **poor outcomes** as well as **unnecessary spending**.⁶
- Outside the clinical setting, departmental and data source silos are a key contributor to **coding errors**, which lead to **denied claims** and **delayed reimbursements**.⁷



Nearly **80%** of improper payments for Medicare Part A inpatient hospitalizations are the **result of insufficient documentation**.⁸

WHY TRADITIONAL NLP FALLS SHORT IN A CLINICAL SETTING

Most discussions about natural language processing and its underlying artificial intelligence (AI) emphasize the power of the technology to process big data. One common example is precision and recall, or the ability for an algorithm powered by AI to return a high number of relevant results while also excluding a high number of irrelevant results.

This is certainly an important attribute of NLP solutions, but it's also important to consider the business issues that an NLP solution could be positioned to solve. For clinical use cases, it's not enough to just find the relevant results. Rather than sifting through a long list of results, a clinician with limited time is best served by reviewing answers to the question they are trying to solve for. NLP solutions need to be able to take additional steps such as, converting relevant results into a standardized format such as a diagnostic or procedure code, or placing results in chronological order.

Traditional NLP solutions fall short in the clinical setting because they have been developed to focus largely if not entirely on processing the data set, not extracting meaning from it.

That's why it's not surprising that healthcare organizations have typically adopted NLP technology to support financial and operational decision-making efforts, leveraging established business intelligence systems to analyze and interpret this data. Financial and operational data sets are much less nuanced than unstructured clinical data sets, which can include a wide variety of acronyms, abbreviations, synonyms, and common misspellings that make clinical language difficult to translate and understand. What's more, clinical use cases for traditional NLP have emphasized the potential to *replace* the work of clinical decision-makers, in processes such as interpreting radiology images or determining care plan interventions, rather than *support* clinical staff in their vital everyday decision-making.

This is a missed opportunity for healthcare. In the right hands, NLP can be programmed to provide valuable clinical context and optimize valuable processes such as, chart review, medical coding, risk adjustment, care determinations, and quality reporting. A clinician-friendly approach to NLP can save time and money while improving accuracy, allowing professionals to spend less time poring over documents for missing tidbits of information, and more time applying their expertise for clinical decision-making.

Taking a more clinician-friendly approach to NLP enables the standardization of unstructured data so that it can be interpreted by not just clinical staff but also medical coders – freeing them to apply their valuable expertise to high-value decision-making rather than searching for an answer during manual chart review.

CLINICAL NLP SPEAKS THE LANGUAGE OF MEDICINE

Clinician-friendly NLP, or clinical NLP, is specifically tailored to the “language of medicine” – the various acronyms, codes, symptoms, procedures, and medications that appear in shorthand or longhand form in physician’s notes and other clinical documents. In addition, clinical NLP can take the crucial step of codifying or standardizing this human-readable information into the clinical terminology needed for accurate diagnosis, coding, and reporting.

The clinician-friendly approach to NLP is more targeted than traditional large-scale data analysis. Clinical NLP emphasizes the value of the data set for the clinical decision-making process, not just the sheer size of the data set. This approach focuses on the specific clinical question that needs to be addressed, paying particular attention to any guidelines, regulations, or reporting requirements that may apply to a given use case. This supports the level of interpretation that traditional approaches to NLP cannot provide.

KEY USE CASES FOR CLINICAL NLP

CHART REVIEW

- Search record for relevant information without reviewing manually
- Faster and more informed clinical decision-making
- Use time and expertise for patient care

VISIT DOCUMENTATION

- Reduce time it takes to document patient encounters in the EMR
- Spend less time in EHR looking for appropriate diagnostic code
- Fewer errors from manual coding or using pull-down menus

MEDICAL NECESSITY & PRIOR AUTHORIZATION REVIEW

- Align search and decision-making with medical necessity guidelines
- Quickly review data (diagnoses, treatments, medications, etc.) related to appeals
- Sort record in chronological order to assess progress or improvement

QUALITY REPORTING

- Save time with augmented queries on common HEDIS measure criteria
- Explore unstructured data for quality concerns manual reviews may miss
- Validate dates of service / diagnosis and eliminate duplicates

RISK ADJUSTMENT

- Quickly locate diagnosis codes within medical records
- Identify clinical indicators that warrant follow-up by providers
- Integrate workflows and scale programs for multiple member populations

STAKEHOLDERS WHO BENEFIT FROM CLINICAL NLP

Clinical staff get faster access to the data they need for decision-making at the point of care. Physicians and nurses may spend 10 minutes looking for information in an EHR – but with their years of education and training, they only need 10 seconds to interpret that information. When NLP is able to parse a record and provide the most relevant information at a glance, clinical staff are free to spend more time making care decisions and engaging with patients. In addition, by pulling the relevant codes from the notes that providers are already writing, clinical NLP can remove the burden of documenting what happened during a visit.

Coding staff spend less time reviewing patient charts for the information they need to select the appropriate diagnostic code. Clinical NLP is designed to identify and surface the specific terminology that coders need to determine the nature of a visit, such as a patient's conditions, any medications prescribed, diagnostic findings, and referrals or follow-ups scheduled. Coders can apply their expertise not to sifting through records but to interpreting them, which leads to faster and more accurate coding decisions, and cuts down on the number of claims that are denied due to inappropriate codes.

Quality reporting staff can augment the search for clinical criteria that are used to determine the value, quality, and effectiveness of care that has been provided. This reduces the time spent on monotonous review tasks while expanding the scope and scale of quality review. Clinical NLP can also help reviewers identify care quality concerns that are likely to only be captured in unstructured text, such as complaints about wait times or potential barriers to care such as transportation scarcity. In addition, clinical NLP can parse a record that includes several lab results or encounters and highlight the most recent instance that can be used for reporting.

Clinical documentation integrity (CDI) specialists are quickly shown items specific to each patient's health story and relevant to that patient's disease burden. The highlighted items can be sorted and filtered down to the specific condition for the CDS to present the most informed clinical indicators to the provider for clarification in the case of retrospective reviews or support the pre-encounter workflow. Human discernment will always be needed to determine the validity of each clinical indicator, clinical NLP can remove extraneous information thereby dramatically reducing review time. CDSs can review a record in at least half the time, feel comfortable the areas of greatest opportunity have been addressed, and touch more lives in the process.



IMPLEMENTING CLINICAL NLP WITHIN YOUR ORGANIZATION

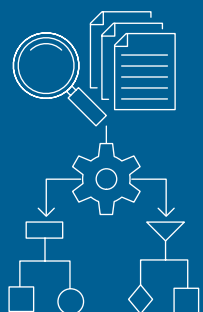
As discussed, clinical NLP is able to take a step beyond traditional NLP because it is tuned to understand the rich clinical context of medical terminology and documentation. Just as clinicians are trained to ask a series of questions to understand what’s happening to a patient in order to make a treatment decision, clinical NLP provides the most value when it has been set up to answer a series of questions that provide context to a clinical decision-maker.

Clinical NLP works best when it is “tuned” to those questions. This enables the NLP engine to search for specific data points that answers those questions while tuning out irrelevant or erroneous data, which improves accuracy and decreases the number of false positives that turn up in a given search. In addition, generating fast and accurate answers to the appropriate questions will minimize the impact on a users’ workflow, as information is available at a quick glance without additional querying or searching.

Tuning clinical NLP is a critical step, as it ensures that the solution addresses a specific clinical use case and provides immediate value to a healthcare organization. Simply put, clinical staff will not adopt a solution that fails to provide meaningful context for the questions they need to answer to do their job and support their patients.

Fortunately, organizations implementing clinical NLP solutions don’t have to start from scratch. These questions typically come from existing resources, whether it’s evidence-based clinical guidance, state or federal quality reporting requirements, or guidelines for insurance coding.

As organizations review these resources and generate the questions that best address their use cases for clinical NLP, it’s important to involve clinical terminologists and informaticists. These professionals will help ensure that the NLP solution’s output is standardized and codified to match the appropriate use case, such as ICD-10 codes for diagnosis or RxNorm codes for prescriptions. They also ensure that terminology libraries remain up-to date in order to generate accurate responses. Organizations may need to consider external resources to support this process.



“Clinical NLP is able to take a step beyond traditional NLP because it is tuned to understand the rich clinical context of medical terminology and documentation.”

“AI” STANDS FOR AUGMENTED INTELLIGENCE

Existing approaches to NLP in healthcare have focused primarily on financial and business operations, with little attention paid to the clear need to make actionable data readily available at the point of care. What's more, use cases have been framed in the context of replacing rather than supporting clinical decision-makers.

Clinical NLP focuses specifically on the use cases that will provide a direct benefit to physicians, nurses, coders, or CDI specialists. Clinical NLP is a form of augmented intelligence that supports evidence-based clinical decision making, not a form of artificial intelligence that replaces individuals in these valuable roles.

Ensuring that an organization gets the most out of a clinical NLP solution requires a methodical approach to selection and implementation. Above all, this process must be clinician-friendly, with clinical staff involved in all stages of the selection process to ensure that the technology will be efficient and accurate while complementing existing clinical workflows. Taking these initial steps will increase the likelihood of adoption and use, enabling the clinical NLP solution to generate meaningful ROI while improving clinical outcomes.

CHECKLIST: CONSIDERATIONS FOR ORGANIZATIONS EVALUATING CLINICAL NLP

Do you need to increase the amount of chart reviews conducted by your team? Do you have specific clinical questions or indicators that need to be found within patient records?

Every investment in clinical software comes with a unique set of requirements and questions, and clinical NLP is no exception. As organizations begin to evaluate their options for clinical NLP solutions, they should consider the following questions, and recognize that they may need support from external resources with focused expertise.

- ✓ Are clinical experts at the table when challenges are being discussed?
- ✓ Do they have a foundation of up-to-date, accurate reference data and a thorough library of clinical terminology?
- ✓ Do they have dedicated clinical informaticists who understand your terminology and data sets?
- ✓ Are they subject matter experts who understand the use case for NLP?
- ✓ Are subject matter experts paired with clinical terminologists and informaticists to tune the NLP technology to increase accuracy and reduce false positives?
- ✓ Will the solution integrate with existing clinical workflows and not require the implementation of new business processes?
- ✓ Will you have assurance that the NLP solution will actually make clinicians and coders more efficient?



Wolters Kluwer

Wolters Kluwer, Health Language provides an innovative suite of healthcare solutions designed to improve your organization's data quality and enable semantic interoperability. Our solutions help health plans, providers, and health IT vendors transform data from abstract to actionable by deriving actionable insights to effectively optimize reimbursement, manage risk, support quality initiatives, comply with regulations, improve operational efficiencies, and enhance analytics.

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