IQVIA NLP Platform For Quality Measures

In a perfect world, all the data we need for HEDIS® quality measurement would exist in one vendor's electronic health record (EHR), in a structured format, accurately captured 100% of the time, easily extractable, and ready to aggregate and submit.

But in the world of healthcare, quality measurement data collection and reporting is far from perfect. Powerful natural language processing (NLP) solutions such as the IQVIA NLP platform enable quality measures to be extracted automatically from clinical documentation, streamlining the collection of data.

Patients move from provider to provider, health system to health system and, more often, from payer to payer. The process of transferring health records from one organization to another results in an abundance of scanned documents, Continuity of Care Documents (CCDs) in XML format, and historical information relayed by patients and/or in unstructured clinician notes. In fact, 80% of the medical record exists in an unstructured format, in text notes or scanned documents. Ignoring these notes often results in reduced performance on quality measures.

Measuring population management

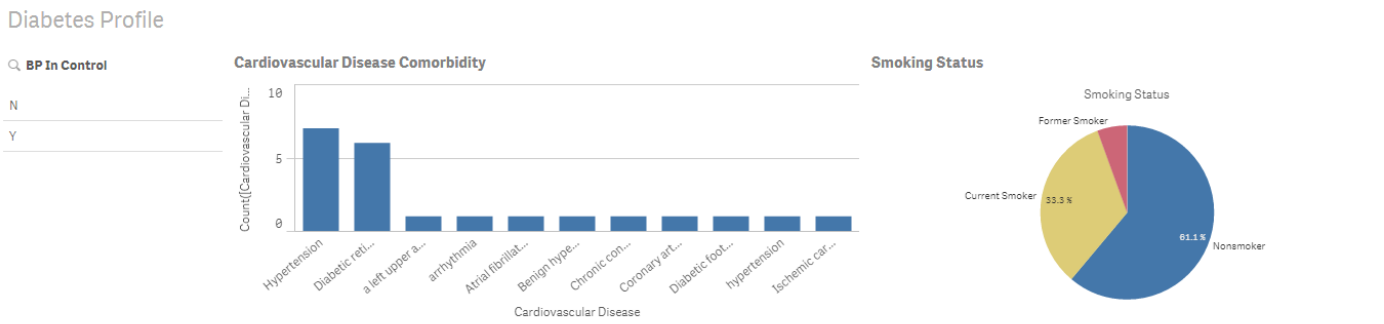
HEDIS® (Healthcare Effectiveness Data Information Set) was created in 1991 to enable the health of patient populations to be assessed consistently (https://bit.ly/2xwo8oN), and has since matured as a means of comparing health plan to health plan, and provider to provider. Over the years, measures have been tweaked, perfected or dropped, and additional populations included. NCQA's Committee on Performance Measurement, a broad-based group representing employers, consumers, insurance companies and others, debates and decides collectively on the content of HEDIS® (https://bit.ly/2XFiefU). Many of the measures can now be captured electronically via structured data forms or collected through surveys. However, one study found that EHR-derived quality measures can undercount practice performance when compared to a manual review of electronic charts (https://bit.ly/2RHIkL8). Many institutions still rely on manual chart review to abstract key information. This is a time-consuming and painful process for the analysts and abstractors doing the work.

NLP streamlines chart review

Several HEDIS® measures comprise a combination of structured and unstructured data. The Comprehensive Diabetes Care measure includes lab results for A1C and nephropathy screening, blood pressure from vital signs and ACE/ARB therapy from the medications list. Determining if the patient has had a dilated eye exam, or has evidence of retinopathy or nephropathy (ESRD, CKD, kidney transplant), often requires an extensive search through unstructured clinical notes. While HEDIS® measures form the foundation of quality measurement, exceptional Population Health Management involves looking at social determinants and co-morbid conditions, to ensure the patient is receiving appropriate follow-up care.

The Linguamatics NLP platform can bring together data from many sources, as shown below, and gather insights hidden in text notes or scanned documents such as physician/nurse/case/care manager notes, diagnostic testing reports, imaging reports, pathology reports, oncology notes or maternity delivery notes.

Figure 1: Dashboard showing population metrics from diabetes patients, all extracted from patient notes using the IQVIA NLP platform



Age Yrs	Gen...	A1C	BMI	BP In Control	SBP	DBP	CKD	Retinopathy	Smoking Status	Alcohol Frequency	Doc
50	Female	10.9	-	N	90	108	Chronic kidney disease	Diabetic retinopathy	Current Smoker	occasional	P110_6106.txt
55	Female	10.9	-	N	147	75	-	Diabetic retinopathy	Current Smoker	-	P110_12620.txt
58	Female	10.9	-	N	146	78	advanced chronic kidney disease	Diabetic retinopathy	Current Smoker	-	P110_2036.txt
59	Male	10.9	-	N	180	92	-	Diabetic retinopathy	Current Smoker	-	P110_12659.txt
65	Male	10.9	-	N	162	76	-	Diabetic retinopathy	Current Smoker	-	P110_3666.txt
71	Male	10.9	-	Y	118	51	Diabetic nephropathy	Diabetic retinopathy	Current Smoker	-	P110_10011.txt

Other issues like heart failure, as shown below, require the analysis of the ejection fraction just to determine if the patient has heart failure and should be included in the heart failure population, or needs to be added to the problem list. Contraindications or allergies to ACE/ARBs and beta-blockers need to be determined in order to exclude ineligible patients from the measure. Ejection fractions are rarely found in a structured field; problem lists are rarely 100% accurate, and patients can be missed.

Figure 2: IQVIA NLP platform results showing heart failure metrics such as ejection fraction and medication details from patient notes, and indicating where individuals are outside their healthy zone

qID	NYHA Class	Ejection Fraction	Type	ACE/ARB	ACE/ARB Dosage	Beta Blocker	Dosage	Hit	Doc
All	All	All	All	All	All	All	All	All	All
1;2;3;4	II	[30, 40] % 30-40%		Ramipril ramipril 10 mg/d.	10 mg every 1d 10 mg/d.	Carvedilol Coreg 25 mg b.i.d.	25 mg every 12h 25 mg b.i.d.	... dyspnea and an EF of 30-40%. ... 80 mg/d., Coreg 25 mg b.i.d., **NAME[VL0F8SMC] 325 ... 5 mg/d., ramipril 10 mg/d., and bumetanide 1 mg... appears to be NYHA class II and might benefit from implantation ...	P102_1503334.txt cache
1;2;3;4	II	[40, 45] % 40-45%		Lisinopril Prinivil 20 mg/d	20 mg every 1d 20 mg/d	Metoprolol Succinate Toprol XL 25 mg/d	25 mg every 1d 25 mg/d	... decline in his EF of 40-45% postoperatively. ... MEDICATIONS: Prinivil 20 mg/d, Toprol XL 25 mg/d and warfarin. ... functional class at NYHA class II.	P102_1503107.txt cache
1;2;3;4	II	[45, 50] % 45%-50%		Lisinopril lisinopril 40 mg	40 mg every 1d 40 mg daily	Carvedilol carvedilol 25 mg b.i.d.	25 mg every 12h 25 mg b.i.d.	... with recovered ejection fraction of 45%-50% status post primary prevention ICD ... continues to endorse NYHA class II functional limitations. ... current heart failure medications including carvedilol 25 mg b.i.d., lisinopril 40 mg daily.	M24Acro__2448.txt cache

Searching for a “negative diagnosis history,” “initial diagnosis date” or measure exclusions can be time consuming if done manually—a chart abstractor has to search the entire chart for the absence of a diagnosis or treatment. In the Use of Spirometry Testing in the Assessment and Diagnosis of COPD measure, the initial date of diagnosis must be determined along with the presence of spirometry testing to confirm diagnosis.

In the Use of Imaging Studies for Low Back Pain measure, the chart abstractor must determine if:

1. the primary diagnosis is low back pain;
2. the patient did not have an imaging study (x-ray, MRI, CT) within 28 days of the diagnosis; and
3. there were any exclusions for clinically indicated imaging studies in patients with a diagnosis of the following conditions: cancer, recent trauma, IV drug abuse, neurologic impairment, HIV, spinal infection, major organ transplant, or prolonged use of corticosteroids.

Addressing the growing burden from manual chart review

As HEDIS® matures, more of the measures require documentation of care plans and follow-up that are mostly documented in unstructured notes. In the Weight Assessment and Counseling for Nutrition and Physical Activity for Children/Adolescents measure, referrals, plans and counseling are variable, and more likely to be documented in an unstructured format as a referral to a weight-management program or dietary consultation. The same holds true for the Care for Older Adults measure, where the presence of power of attorney or advance directives documents may be present in the chart, while other advanced care-planning decisions/discussions are found in the clinician notes.

The IQVIA NLP platform can help gather insights from unstructured text and reduce the amount of manual chart review, enabling focus to be kept on care of the patient.

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