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A seismic shift has occurred in the healthcare landscape. As proactive advocates of their own health with unlimited access to information, today's patients seek more from the pharmaceutical industry than ever before. They are savvy consumers who seek holistic support beyond the medication, customization and personalization of services, and seamless integration of live and digital tools.

The evolution of patient needs and the rising tide of expectations are shaping a new era in healthcare, one that calls for a paradigm shift in the pharmaceutical industry's approach to patient support. Embracing patient-centeredness, harnessing cutting-edge technology, and fostering transparent communication are the pillars on which transformative patient engagement programs can be built. By aligning with these evolving patient needs, the pharmaceutical industry can create a future where patients are not just recipients but active partners in their own health journeys.



Delivering on these heightened expectations has fueled the urgency to invest in patient engagement and support. As pharmaceutical companies channel ever-increasing resources into these transformative initiatives, the need for robust and comprehensive measurement becomes not just an option, but an imperative, in order to validate allocation of resources and effectiveness of the investment.

In embracing the transformative potential of patient engagement, the pharmaceutical industry is taking giant strides towards a future where healthcare is truly patient-driven, compassionate, and effective. This increased investment has a strong rationale.

Engagement and Support Investment: Good for Patient, Good for Pharma

There is a still a divide between what patients consider important, and what patients say biopharma delivers today. This gap is what the industry seeks to solve through increased investment in patient engagement.

Investment in patient engagement has a direct impact on health outcomes. Engaged patients are more likely to follow prescribed treatment regimens, participate in preventive measures, and manage chronic conditions effectively. This leads to reduced hospitalizations, better disease management, and improved overall quality of life.

A survey by the Pharmaceutical Research and Manufacturers of America (PhRMA) found that:

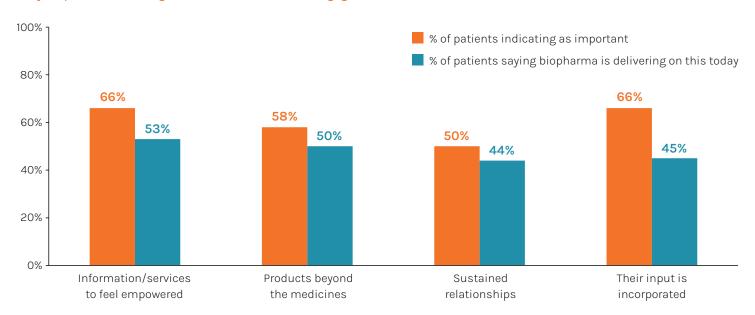
83% of patients expect pharma companies to provide support

74% of patients believe that pharma companies have a responsibility to provide support

At the same time, this improvement in health outcomes directly influences the commercial success of pharmaceutical companies. Investing in patient engagement creates stronger brand revenues through reduced abandonment and improved adherence. Investments in patient engagement and support are not merely financial decisions but are instrumental in elevating brand reputation.

By empowering patients, improving health outcomes, and driving commercial success, patient engagement holds the key to unlocking a future where patients are at the center of their healthcare journey.

Why Biopharma is Making the Investment in Patient Engagement: Current State¹





Measuring Results: Key to Smart Next Steps

As patient engagement becomes a crucial component of pharma's commercial strategy, the measurement of these programs becomes essential for multiple reasons.

The obvious one, of course, is that measuring the impact allows pharmaceutical companies to assess the effectiveness of patient engagement programs. It determines if these programs achieve their intended goals and produce the desired results.

It also contributes to data-driven decision making. The insights gained from measuring impact allow companies to refine and enhance their programs, tailoring them to better meet the needs of patients through updates and optimizations. This refinement extends beyond efficacy to efficiency. Data from programs enables better resource allocation and ensures investments are directed towards strategies that provide the highest return.

In addition to being beneficial to the pharma company, measuring impact generates valuable evidence to present to stakeholders, including regulatory bodies, healthcare providers, payers, and investors. Demonstrating the positive impact of patient engagement programs fosters trust and support from these stakeholders. In fact, with more and more drugs needing to continue to show efficacy after approval, some regulatory bodies and payers may require pharmaceutical companies to demonstrate the impact of patient engagement programs to ensure

compliance with certain standards. Measuring impact allows companies to meet these reporting requirements.

Measuring impact also allows companies to differentiate themselves based on the positive impact of their patient support programs. As the healthcare industry becomes more patient-centric, pharmaceutical companies compete to stand out and demonstrate their commitment to patient well-being.

Lastly, a greater emphasis on measurement identifies potential risks or challenges associated with patient engagement programs. It allows companies to proactively address issues and implement mitigation strategies to avoid negative consequences.

The key to effective measurement is ensuring the patient engagement program has a measurement plan that is tailored, comprehensive, and flexible, so from launch they are focused on the right outcomes and assessed on their ability to drive impact in key areas.

Patient engagement programs are vital for delivering patient-centric care in the pharmaceutical industry. However, to truly harness their potential, pharmaceutical companies are rapidly increasing their investment in measurement. Continuous improvement and iterative evaluation are essential to ensure that patient engagement initiatives evolve to meet the dynamic needs of patients.

Major Drivers

As Investment Rises, the Importance of Measuring Patient Engagement Programs is Growing

Effectiveness measurement

Data-driven enhancements

Optimization of resources

Evidence to key stakeholders

Market differentiation

Compliance and risk mitigation



Building a Strong Measurement Plan

A well-structured measurement plan is essential for evaluating the effectiveness and impact of a pharmaceutical patient engagement program. It enables biopharma companies and their solution providers to make sure that appropriate and relevant data is identified, captured, analyzed, and reported to address specific brand needs. The plan also helps verify that changes and improvements are incorporated to increase effectiveness and deliver on the objectives the brand intended.

The first step is to identify the specific goals and objectives of the patient engagement program. These objectives should be clear, measurable, and align with the program's intended outcomes, such as reducing abandonment or improving treatment adherence. Setting baselines or benchmarks before implementing the patient engagement program creates reference points for assessing impact and effectiveness over time.

From there, determine the key performance indicators (KPIs) that measure the success of the program. These KPIs should align with the program's objectives and can include metrics such as patient satisfaction scores, patient fill rates, etc.

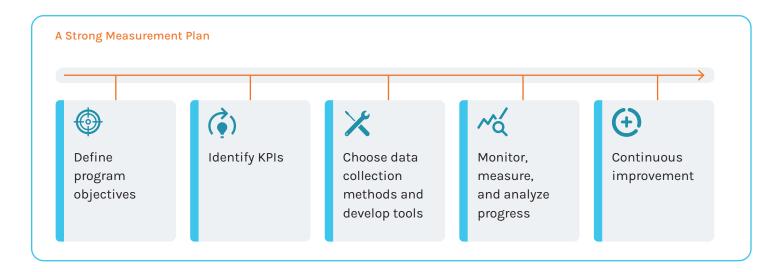
Based on the KPIs measured, it's important to select appropriate methods to collect relevant data, such as surveys. This will likely require data collection tools, such as questionnaires, to capture the necessary information. Ensuring that these tools are user-friendly and capable of providing actionable insights is critically important.

Additional training for personnel who utilize or administer these data collection tools is important, such as clinical nurse educators who may be the point of contact for patient support.

Once implemented, regularly monitor the program's progress and measure the identified KPIs at predefined intervals. This allows for real-time evaluation and timely adjustments to improve program outcomes. Beyond just capturing and monitoring the data, analysis of the program's performance against the established KPIs provides a more comprehensive picture for insight into the program's effectiveness, strengths, and areas for improvement.

Last, in addition to sharing the findings and outcomes of the measurement plan with relevant stakeholders, utilize the insights gained from data analysis to continuously improve the patient engagement program. Implement necessary adjustments based on data-driven decisions to enhance patient outcomes and program success.

This measurement plan becomes the foundation of evaluating success of the program and validating the return on investment. Revisit the plan every six months to ensure the foundation doesn't need adjustment. Reasons to change the program include changes to KPIs, baseline levels, or even data collection methods. There are best practices specific to KPIs across patient engagement programs, and it's usually a combination of leading and lagging indicators.





Data Points: Leading and Lagging Indicators

Leading indicators for patient engagement are metrics or data points that precede a specific outcome. In the context of patient engagement programs, leading indicators are early signals that help assess the program's potential success or effectiveness before measurement of final outcomes such as reduced abandonment, improved persistency, and better patient experience.

Many leading indicators fall into the category of activity data, often interchangeably referred to as engagement data. This provides insight into how successful the patient engagement program is at reaching and providing support to patients. Common metrics at the start of a program journey include the volume of patients received. The patients are then connected live to discuss support, and of those, the total that opt in to receive support from the pharma company determine active participation rate.

Active participation rates in a program—and the metrics that lead up to it—are the first place to look for engagement insight. There are several metrics: connection rate, talk time if intervention is human, open and/or click rates if intervention is digital, and topics discussed. These

metrics provide information on how patients choose to engage in the program. To that end, measurement of continuation rates of patients along the support journey provides good indications of drop-off points and opportunities for improvement, especially when capturing program discontinuation rates from patients.

In addition to activity data, other leading indicators include the patient's confidence, knowledge, motivation, and satisfaction level. Understanding how patients progress in these four areas through the support that's provided can be a strong leading indicator of whether the outcome measures or primary endpoints of the program are successfully being met. Increased confidence, knowledge, motivation, and satisfaction lead to improved medication outcomes.

The most robust measurement studies look at the lagging indicators for performance. These are the KPIs that reflect the main goals of the program and can often be translated into a financial benefit for the pharma company. Examples of those include:

- Reduced abandonment or increased first fill rate of program participants compared to non-participants.
- Improved persistency and continued fill rate of patients in the program versus those that are not.
- Superior patient experience, often measured as a NPS score, which determines the likelihood of patients recommending the program to others.
- Reduction in cost by evaluating overall healthcare costs including hospitalization rates.
- Patient reported outcomes used to measure the impact of a patient's health condition and treatment on their overall quality of life.

Unlike traditional clinical measures that focus solely on disease-specific outcomes, these patient-reported outcomes capture the patient's perspective, subjective experiences, and well-being in relation to their health and treatment.

Being able to measure these KPIs requires a sophisticated approach to data collection, with the support of tools to ensure that it's being done in the right way.



Leading Indicators

- Reach
- · Confidence level
- Opt-in rate
- · Knowledge level
- Active participation
- Motivation level
- Continuation rate
- · Satisfaction level
- Topics discussed



Lagging Indicators

- · Reduced abandonment
- Improved persistency
- · Superior experience
- · Reduction in cost
- QOL patient-reported outcomes





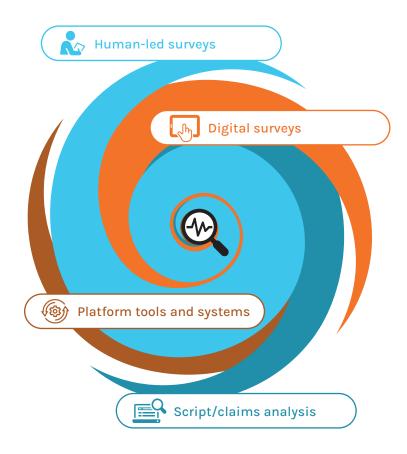
Approaches to Data Collection

First and foremost, using a patient engagement solution provider's platform tools and systems can be a highly effective way to collect data from programs in a more automated and passive manner. This frees up effort and time of the personnel supporting the patient and/ or the patient themselves. Many of the leading platform tools track the variety of patient activity or engagement metrics referred to in the previous section. This data can give great insight into patient enrollment, interaction levels, usage patterns, participation, and continuation. Sophisticated systems can also delineate the engagement data based on whether it's human support, or automated digital support.

Another effective data collection method is surveys. There are two types that can be utilized.

- Digital surveys are those delivered in an automated fashion to a patient, which are helpful when looking to measure certain patient satisfaction metrics, since those are datapoints that can be biased if asked by a human. Digital ensures the responses remain anonymous and confidential, encouraging honest and candid feedback. Digital surveys enable prompt and efficient collection of patient feedback on their experiences with the support program. This feedback helps assess patient satisfaction, identify program strengths and weaknesses, and gather suggestions.
- Human-led surveys are those that are conducted by the personnel who support the patient, and can offer more in-depth insights into patient experiences, challenges, and motivations. These are useful to utilize when seeking to understand changes and progress of a patient's confidence, knowledge, and motivation level. The reason human-led is better for these leading indicators is because this information is sometimes nuanced and difficult to obtain via digital surveys. Capturing this information also enables the personnel supporting the patient to adapt their support based on what they learn.

Finally, and most often used to measure lagging indicators, is script data or claims data analysis. While most solution providers won't have access to this,



many will partner with leading research firms such as IQVIA and ZS to execute these types of data collection methods. Prescription analysis provides data on fill and refill patterns, offering an objective measure of treatment adherence and persistence. Analyzing medical claims reveals patterns in healthcare utilization, such as hospitalizations or emergency room visits, helping assess the program's impact on reducing healthcare resource utilization.

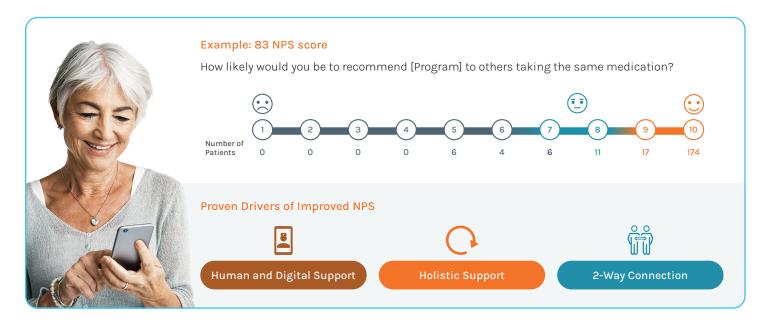
Regardless of the data collection methods and tools used it is important to ensure they all comply with relevant data privacy and security regulations such as HIPAA to protect patient information. Additionally, obtaining informed consent from patients as part of their enrollment in the program is essential when collecting personal health data for research or program evaluation purposes.



Net Promotor Score Analysis

Another tool for evaluating patient engagement performance is the Net Promoter Score (NPS) survey. It is a valuable metric because it provides a clear indication of a patient's experience. The survey is executed digitally to remove bias and typically consists of a single question: "On a scale of 0 to 10, how likely are you to recommend [Company/Product/Service] to a friend or colleague?" Based on responses to the survey question, respondents are categorized into three groups: Promoters (score 9-10), Passives (score 7-8) and Detractors (score 0-6).

The final NPS can range from -100 to +100. A positive NPS indicates that there are more promoters than detractors, while a negative NPS suggests the opposite. Generally, an NPS higher than 50 signals a very positive patient sentiment. For example, Apple's NPS is 72.



This metric becomes very useful for pharma companies because, currently, the industry's NPS is lacking. In fact, in a recent study of 20+ large and small pharma companies, the NPS average of the industry was hovering around a 6, comparable to the airline and insurance industry.

A few of the key drivers of higher NPS in patient engagement programs are, first, the combination of both human and digital support. They offer complementary benefits and when used together have demonstrated that the patient experience is improved. Patients seek human connections to build trust and experience the empathy they expect when managing a complex therapy regimen for a chronic disease. At the same time, patients want convenience and easy access to support, which can be enabled through digital tools and self-serve applications.

Additionally, companies should ensure the patient engagement program expands to supporting patients holistically even beyond the medication. Just servicing financial needs or clinical needs isn't sufficient. For patients to feel empowered and in control of their health and experience, they want support that expands into areas of wellness, emotional or mental health, and other critical areas.

Finally, another proven driver is the importance of a 2-way connection. Patients knowing they can reach the person who is their champion for support when needed increases satisfaction. It provides the assurance they are never alone, and that addressing questions or concerns doesn't have to happen in isolation.



Main Drivers for Reduced Abandonment

In addition to substantiating the quantitative impact, it's helpful to understand the main drivers leading the patient engagement program to reduce abandonment. While there may be many factors, a few that we've studied can create a meaningful difference.

The first factor is the establishment of an immediate connection. Based on the solution design, whoever is the patient's support resource should be able to proactively reach out to the patient within hours of the patient being prescribed medication. This requires capturing appropriate consent and patient contact information, while also transferring data through APIs; this ensures there is limited time a patient has between the doctor visit and meeting the individual who will be their go-to resource throughout their treatment regimen.

A second factor is the importance of addressing non-financial barriers. Of course, one of the biggest drivers of abandonment of script is cost; however, an effective HUB program can help address that.

There are numerous other barriers patients face such as the emotional burden of coping with the diagnosis, or the lack of motivation due to feeling isolated, or the lack of understanding of the disease and product to recognize the importance of starting on the medication.

A patient engagement program that is designed to address these clinical, logistical, and emotional barriers early on sets expectations, provides knowledge that's required, and

improves confidence they're making the right decision and will have the resources they need to succeed.

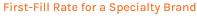
Lastly, is the use of live, triage support. Pharma companies invest in many other services beyond patient engagement, such as the HUB and specialty pharmacy. Ensuring that the support personnel who are at the frontlines with patients have access to the full view of the patient's profile and progress can be critical to ensuring transparency is provided to the patient, and if issues arise, appropriate triage is done to make the patient feel supported and not being "handed-off" between patient support providers.

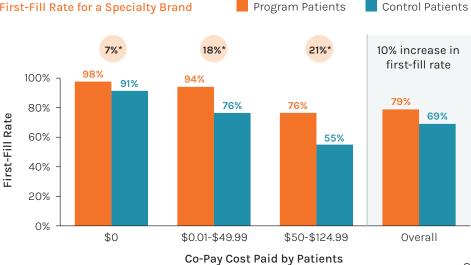
The chart shown here is an example of an abandonment analysis completed by IQVIA, one of the leading research firms in our space. For this specific patient engagement program, IQVIA evaluated the first fill rate of patients that received support through a pharma patient engagement program, once they were prescribed the therapy, known as the test group, and those patients that did not receive support once they

were prescribed the therapy, known as the control group.

To only evaluate the impact of the program, and no other factors, IQVIA utilized a 1:1 matching methodology, pairing each patient in the test group with a patient in the control group that looked similar on several factors including payer type, out-of-pocket cost, and other variables. What this chart shows is what the first-fill rate was for patients who received support in the orange vs. patient who didn't receive support in the blue. On the far right, you can see that overall result, this patient engagement program drove a 10% increase in first fill rate vs. what would have happened without a patient engagement program in place. This result was statistically significant at a 95% confidence level.

This study remains a gold-standard in terms of quality because it uses actual script data or real-world evidence and removes bias by setting up a test vs. control, ensuring that any other factors that could have resulted in the impact have been removed.





* Statistically significant at the 0.05 level



Personalized Patient Journey Aims to Improve Persistency

One of the biggest drivers of persistency is delivering a personalized patient journey. Programs that are customized and do not utilize a one-size-fits-all model have demonstrated larger improvements on adherence by being more relevant to patients' lives and health conditions. This relevancy shows patients that the support program is designed for them, leading to higher engagement and adherence. A personalized journey embraces a patient-centered approach, where patients' needs and preferences are central to the care plan.

This approach cultivates a sense of partnership between patients and the pharma industry. It fosters a sense of trust and rapport where patients feel that their needs are understood and valued, encouraging them to adhere to treatment recommendations.

However, upfront personalization of the patient support journey isn't enough. A patient's adherence risk, needs, behaviors, etc. change, evolve, and even ebb and flow throughout their time on therapy.

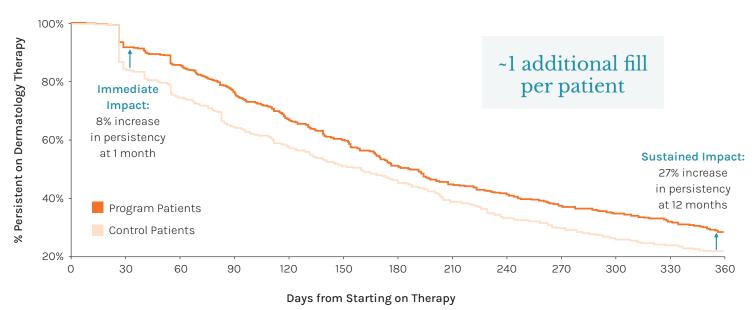
Because these aren't static, to really maximize the impact of patient engagement, support not only has to be personalized, but it also must be dynamic on an ongoing basis, shaping itself to the best response for each patient. For example, if a patient is progressing through the support journey quicker than anticipated, and the

feedback is they are comfortable managing their therapy, it likely makes sense to shift the mix of interaction towards more automated, self-serve type of support. Or, if a patient's activity levels on their smart watch change drastically from their baseline levels, it's likely a signal of a change in status of the patient and a need for personal support, which even if there is a planned intervention, providing an ad-hoc intervention makes sense.

Finally, another key factor is the use of a primary point of contact (PPOC) model. To streamline the patient's experience, many companies leverage a PPOC engagement model versus having siloed constituents engage with the patient at different points of time. This PPOC often engages around the time of Rx and stays with the patient through the ongoing support and adherence phases of their journey on product. Through this model, the PPOC can build a deep and sustained relationship with patients that allows for rich insight capture that enables the pharma company to have a more direct connection with patients.

The chart shown here is an example of persistency analysis completed by a pharma company. For this specific patient engagement program, the company's analytics team evaluated the persistency rate of patients that started therapy, i.e., didn't abandon script, and

Pharma Company Persistency Analysis





received patient support, also known as the test group and the persistency rate of patients that started therapy and didn't receive support, also known as the control group. In this graph, the test group is orange, and the control group is light orange.

To only evaluate the impact of the program, and no other factors, the client utilized a 1:1 matching methodology like the IQVIA analysis we just reviewed, pairing each patient in the test group with a patient in the control group that looked similar on several factors including age, gender, payer type, etc.

What this graph shows is that starting with the second fill at Day 30 all the way through Day 360 on therapy, patients in the support program filled at a higher rate or said another way were more persistent than those like patients not in the support program. Specifically, when looking at the separation between the test and control, there is an immediate impact where at the end of first month 8% more patients persistent to therapy with the support program vs. those without, and there is a sustained impact where at the end of month twelve 27% more patients are persistent to therapy with support program vs. those without.

To understand the business impact, many companies will translate this to the average additional fills or months on therapy. In this case, it represents one additional fill per patient.

Data Empowers Innovative Tools

The data collected for the delivery of patient engagement programs and measurement of the impact we discussed are beginning to power a host of innovative solutions that many leading patient engagement providers incorporate into their programs. Three solutions have seen much broader adoption.



The first is predictive models, which are statistical models that use a variety of patient data, demographic, psychographic, medical history etc. to make predictions about future patient outcomes, behaviors, or needs. The model is designed to analyze patterns and relationships within the data and then apply those patterns to new data to make informed predictions. In the context of patient engagement programs, predictive models aim to anticipate patient needs and optimize interventions to be more individualized.



Second are next best action engines. These machine learning applications use advanced algorithms and data analytics to suggest the most appropriate and personalized course of action for a specific situation or individual at that given point in time or said another way for the next intervention.



Last are NLP, or natural-language processing insights. This refers to insights gleaned from valuable information and patterns extracted from unstructured text data. NLP is a subfield of artificial intelligence that focuses on the interaction between computers and human language. It enables machines to understand, interpret, and generate human language, allowing for the analysis of vast amounts of text data that can be captured through the delivery and measurement of patient engagement programs.

Solution providers tap into a host of different real-time, real world data sources to guide how the patient engagement needs to be adapted. Examples of sources for these data sets include patient feedback and progress, patient sentiment analysis from conversations, new information that's coming from other solution providers in the patient support program, and even patient-generated health data from wearables like an Apple watch or through mobile apps like Noom.



A Closer Look at Predictive Models

By combining program data with compliantly available patient data, predictive models can be powered to inform greater personalization within patient engagement programs, improving their efficacy and efficiency. Some common predictive models used by leading patient engagement companies include:

Adherence Risk Model



This assesses the likelihood of a patient being non-adherent to their prescribed treatment plan. This is built using various patient-related factors to estimate the probability of non-adherence, allowing the solution provider to focus on patients at higher risk and tailor interventions to improve adherence.

Health Literacy Model



This model is a framework designed to assess an individual's ability to obtain, process, and understand basic health information and services to make informed decisions about their health.

Digital Literacy Model



This is designed to address patients' ability to effectively use digital health technologies and navigate digital platforms. Digital literacy refers to the skills and knowledge required to access, understand, and utilize digital tools and resources.

Barriers Assessment



This is a systematic evaluation of the potential challenges that patients may face in accessing, utilizing, or benefiting from the support program. The goal is to identify and understand the factors that impede patient engagement, adherence to treatment plans, and overall success of the support program. This assessment is often used in combination with adherence risk models.

Social Determinants of Health (SDOH) Assessment



This predictive model is a systematic evaluation of the social and environmental factors that influence a patient's health and well-being. SDOH are the conditions in which people are born, grow, live, work, and age, and they encompass various factors such as socioeconomic status, education, employment, housing, access to healthcare, and community support.

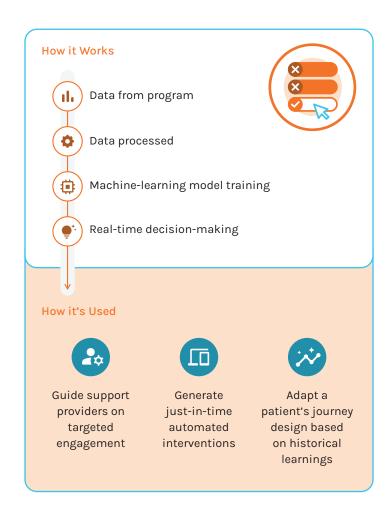
These predictive models, combined with patient preferences and the patient's learning style, can influence tactics such as the number of interventions, the timing of interventions, the topics covered in each intervention, the format of the intervention, and the channel of communication that is used in each intervention. Advanced models that iterate in real-time can also inform non-planned interventions, or just-in-time engagements to drive greater impact.



Plotting an Al Course for Next Best Action

Machine learning next best action (NBA) in patient support refers to the application of artificial intelligence to determine the most suitable and personalized course of action for each individual patient at that given point in time. The NBA helps personnel providing patient engagement at the solution provider—such as Clinical Nurse Educators—to deliver timely and targeted support, interventions, or recommendations to patients. This tool can also be used to generate automated interventions delivered from the system, and even inform how the patient journey design should be adapted.

Solution providers with this capability use data already collected for the program, either for delivery and/or measurement, and then process it into a suitable format for the AI algorithms. From there, advanced machine learning algorithms, such as reinforcement learning, decision trees, or deep learning models, are trained on all the historical data that is shared. The models learn from past patient interactions and outcomes to identify patterns and associations. Then, as new patient data becomes available, AI continuously updates its predictions and generates real-time recommendations. These NBA recommendations can be specific actions for the clinical nurse educators or personalized, automated interventions for patients.



Natural Language Processing Insights

Natural language processing (NLP) insights are also known as interaction analytics. This refers to the high volume and variety of data captured through patient engagement programs that, previously, was difficult to make actionable. Now with NLP, a form of AI technology, we can better capture the voice of the patient at scale by mining all this data and reporting on it in a systematic way. The benefit of NLP is that it can be applied to structured and unstructured data across silos. It's already helping companies create a "voice of the market" feedback loop for key business areas such as medical affairs, market access, sales, and brand teams.

By using NLP to mine data captured from patient engagement programs, like call recordings, the types of

insights that can be captured and segmented by type of patient are things like the key topics being discussed with patients, sentiment analysis of patients, and even the ability to run ad-hoc queries on the data if there are specific strategic questions that need to be addressed.

Otilizing interaction analytics, brands now get a level of "context" that is often missed. Patient engagement programs report things like activity data, self-reported patient adherence data, and can be measured using test versus control comparison of persistency, but what AI NLP tech allows for is rich insight sharing that contextualizes all this other data and offers a clearer picture into what's happening with the patient. This allows us, as an industry, to drive value in the patient engagement program design.



Taking the Next Step

In an era of soaring investment into patient engagement programs by pharma, embracing data helps to validate the sizeable investment in patient support. The key to unlocking the true potential of patient support lies not only in the size of the investment but in the depth of its impact assessment.

As we look to the future, let us embrace the potential of data-driven approaches and innovative tools in patient engagement. Together, we can create a healthcare landscape that not only improves patient outcomes but also fosters a stronger and more connected healthcare ecosystem. Through a commitment to data-driven excellence, we make a lasting impact on patient lives and the healthcare community.



About VMS BioMarketing

VMS BioMarketing is the leading provider of patient engagement solutions integrating human connection, advanced technology, and real-world data to deliver holistic support in a dynamic and personalized environment. Leveraging 25+ years of experience in patient engagement, we know consumers want to build and develop relationships with the pharma companies whose products they utilize, and the research shows these relationships are vital to achieving the right health outcomes for patients and business outcomes for clients. Our innovative and award-winning platform, One Voice™, can empower your brand teams to build authentic relationships with patients by uniquely combining data-driven technology and human interventions using our proprietary, intelligent algorithm to determine the right level of support for each patient based on disease state, product type, adherence risk profile, social determinants of health, real-world evidence, demographics, and psychographics to optimize the right mix of human and technology-driven interventions.



Visit us at vmsbiomarketing.com.