
Health Plan Use of Patient Data: From the Routine to the Transformational

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Avalere Health
An Inovalon Company
1350 Connecticut Ave, NW
Washington, DC 20036

202.207.1300
Avalere.com

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Executive Summary /

As the abundance and variety of patient data elements and sources continue to grow, health plans seek opportunities to deepen insights from multiple sources of patient data to shape care delivery, improve system efficiencies, and achieve better health outcomes. However, there is still considerable work to do in order to achieve health systems' transformational goals. Based on interviews with executives within health plans and third party sources that support these efforts, we present a framework for how patient data is used to improve care. We identify seven use cases, each with distinct benefits, limitations, impact, and resource requirements (e.g., data infrastructure and/or staff), on how health plans use data. Use cases range in sophistication from routine source approaches to sophisticated multi-data source care management applications. Even within a given data use, plans vary in the sophistication of data analytic capabilities, and in approaches to applying it to care delivery, system efficiency, and patient outcomes.

The health plans we surveyed identified many challenges – for which solutions could improve insights and the efficiency of care. These include: varying documentation requirements, lack of integration and coordination between data stored within or outside of the electronic health record (EHR), and misalignment of incentives between providers who deliver care and generate clinical data, health systems reporting care, and health plans who pay for care. We highlight data benefits to improve care and care efficiency; concurrently, we highlight potential misuses of patient data.

This issue brief is intended to serve as a roadmap for:

- Patient groups seeking to understand how patient data may be used
- Providers interested in understanding how clinical documentation is used for reimbursements
- Policy makers developing programs to improve care and reduce costs
- Health plans who are interested in developing more sophisticated applications of patient-level data, including the assessment of non-medical factors in novel ways, to improve population health and health care delivery.

	Use Case	Benefits	Limitations	Labor Resources
<p style="text-align: center;"> Advanced Practice ----- More Sophisticated ----- Routine </p>	Value-Based Contracting	Align financial incentives with quality and cost outcomes	Potentially challenging to operate	Clinicians, actuaries, legal, finance
	Predictive Analytics	Anticipate individual and population care needs	Variable reliability of patient data	Clinicians, programmers, statisticians, finance
	Clinical Pathway Development / Design	Apply evidence-based guidance to reduce patient care variability	Limited evidence of impact on care delivery quality and costs	Clinicians, third party vendors, analysts
	Population Health Management	Improve care coordination and outcomes at reduced costs	Longer time horizon for return on activities	Analysts, clinicians, non-clinical staff, finance
	Network Design	Build provider network with high quality and lower costs	Potential reduction in patient choice of providers	Finance, legal, clinicians, analysts
	Treatment and Medication Adherence	Improve quality and reduced costs	Challenges influencing patient behavior	Analysts, clinicians, non-clinical staff
	Utilization Management	Direct resources appropriately and efficiently	Variable reliability of patient data	Clinicians, analysts

Introduction /

The 21st Century Cures Act, signed into law in December 2016, created public sector investment to drive improved capabilities of transmitting, receiving, and accepting data to improve the quality of patient care. Specifically, the Act aims to reduce physicians' regulatory and administrative burdens, as well as include incentives, for the meaningful use of EHRs. This is increasingly relevant as physicians rely on EHR reporting to participate in the Center for Medicare & Medicaid Services' value-based payment initiatives, including the Merit-based Incentive Payment (MIPS) program, and commercial value-based payment initiatives, like private, quality-based reimbursement agreements. The Act also supports the development of a trusted health information exchange (HIE) framework that connects physicians and other providers through strengthened interoperability. Lastly, the Act spurs improved patient access to electronic patient data through secure, accurate, and interoperable means.

Health plans play a significant role in aggregating, synthesizing, and analyzing data for care improvement, financial management, patient engagement, and other budding areas. In both the public and private sectors, health plans consolidate and analyze extensive amounts of patient data.

To clarify the uses and transformational potential of these activities, we have focused on three key questions:

- How are health plans leveraging access to vast amounts of patient data to shape care delivery, improve system efficiency, and achieve better health outcomes?
- What are the potential benefits, current limitations, and impacts of using patient-level data to inform care delivery and health plan operations?
- What are the industry's best practices and leading voices' cautions associated with using patient-level data?

Methodology /

With a goal of identifying existing and new practices for advanced data analytics among health plans using patient data, Avalere and the National Pharmaceutical Council interviewed a range of experts familiar with the use and application of patient data by health plans. Avalere recruited and screened participants prior to completing interviews with six experts, who were executives within a health plan or health data analytics firm and able to discuss trends and advances in using patient data for analytics. These interviews formed the foundation for the issue brief.

Definitions /

To establish a common language, we offer definitions of two foundational terms, which are ubiquitous in the health care industry, yet sometimes carry different meanings for different stakeholders: Electronic Health Record and Patient Data.

Electronic Health Record: An electronic version of a patient’s medical history, which includes key data relevant to the patient, including demographics, health status, past medical history, medications, laboratory data, and progress notes. The patient care team can record patient information in the EHR in real-time, as well as enable patient access to the data.

Patient Data: Information about a patient’s interaction with the health care system. Patient data is typically categorized into two types: information about the patient’s health (e.g., diagnoses) and services that a patient receives (e.g., screenings and tests). Patient data are available in multiple sources, including: electronic health records, administrative claims (e.g., pharmacy benefits, physician office visits, or discharge summaries), laboratory results, patient-reported information or patient portals, in-home condition monitoring, and mobile health devices.

Seven Use-Cases of Patient Data /

We identified seven use cases for patient data and detail current applications of patient data analytics that health plans may employ. The qualitative order, drawing from interviewee perspectives, arranges the practices advanced to more sophisticated to routine practices. For each practice, we describe the purpose of the practice, associated benefits, types of data used, a broad sense of labor involved, and, finally, limitations. In addition, we include vignettes and examples of practices to help provide familiar context.

Value-Based Contracting – Advanced Practice /

“Harvard Pilgrim Health Care and Eli Lilly entered into value-based contract for an osteoporosis medication to improve treatment adherence. Aligning plan and industry interests is only possible with robust data supporting the contract.”

Medical Director,
Regional Health Plan

A health plan may engage in value-based contracting (VBC) with a variety of parties including care delivery organizations, manufacturers, and digital health providers. The overall goal of VBC is to align financial incentives and drive high-quality outcomes at lower costs. From the health plan’s perspective, VBC can help slow the growth of, or even decrease, financial risk while increasing patients’ access to treatments. In addition, as physicians enter into shared-risk contracts with health plans, both are increasingly incentivized to pay closer attention to and monitor their performance on quality measures. Based on the physician’s performance, both the health plans and physicians may realize savings.

Value-based contracting between a health plan and manufacturer involves a number of diverse stakeholders from the finance, legal, clinical, and analytic sectors. Clinical and actuarial staff provide input on the terms of the contract (e.g., one-side vs. two-sided risk), and performance metrics (e.g., treatment adherence, achievement of clinical outcomes, or management of total cost of care). Other staff, such as legal and finance, are needed to support development of the contract. While VBC may use electronic records, these contracts typically use claims data to assess events (e.g., readmission), lab results (e.g., blood sugar), or adherence to treatment.

For payer-physician VBC, health plans can use existing data to iteratively construct future value-based contracts with physicians that are more tailored to individual performance. Similar to value-based contracting between payers and manufacturers, clinicians, actuaries, and representatives from legal and financial teams support the development and execution of agreements. Health plans provide data analytics support to clinicians to provide metrics on quality and costs. At the end of contract or agreement, data analysts measure the incentives, penalties, or shared savings.

VBC is a relatively recent development in the health plan industry. These contracts can be complex and may be challenging to operate. Ultimately, the financial or health upside of the VBC must be sufficient to compensate for the data collection and evaluation costs.

Predictive Analytics – Advanced Practice /

“By analyzing claims data along with expected care plan patterns, plans can identify patients with possible undiagnosed conditions who may benefit from additional clinical support.”

Senior Vice President,
Healthcare Data Analytics Firm

While health plans have access to their own clinical and claims data assets, the opportunity to leverage predictive analytics from “big data” to better anticipate the care needs of a diverse patient population grows in importance. Through anticipation of future needs and proactive deployment of resources to address these needs, plans are positioned to support highly targeted, patient-specific care. Predictive analytics may address three common patient groups:

- Patients who may develop a condition based on existing patient data
- Patients who may benefit from a treatment or assessment based on existing patient data
- Patients who may not comply with treatment plans based on prior treatments or existing characteristics

Through predictive analytics, health plans may reduce long-term costs and improve patient outcomes and satisfaction through a reduction in acute care and emergency department utilization. Using claims data, health plans can predict whether a patient might have undocumented conditions.

Predictive analytics rely most heavily on the availability of data, risk algorithms, data analysts, programmers, and statisticians. In the short-term, there are significant infrastructure (e.g., software and data analytics) and staffing requirements, such as bringing on analysts and statisticians. Opportunities also exist in identifying algorithms that are sufficiently sensitive and specific to predict future events. Currently, predictive analytics are in a fairly nascent stage. Some plans perform it, although several contractors provide these services. If performed accurately, health plans could increasingly develop algorithms that prospectively risk-stratify patients. Such stratification may enable physicians to increasingly identify and anticipate needs of patients with various conditions. However, according to one interviewee, even if a health plan leverages high-quality data to target patients for evaluations and interventions, opportunities remain for health plans to develop mechanisms to affect meaningful improvements in patient outcomes for certain quality metrics (e.g., improved HbA1C levels).

Clinical Pathway Development/ Design – Advanced Practice /

“Oncology-specific clinical pathways have reduced cancer-related costs, in-patient hospital admissions, and average inpatient days per patient.”

Chief Medical Officer,
Regional Health Plan

“Developing clinical pathways has reduced our post-operative length of stay for arthroplasty.”

Medical Director,
Regional Health Plan

Some health plans are developing clinical pathways to help guide patients toward evidence-based, cost-effective treatments that improve patient outcomes and quality of care. Clinical pathways provide specific guidance on the types and sequence of care processes for a particular condition (e.g., estrogen receptor positive breast cancer). Clinical pathways may consider evidence, including clinical practice guidelines, on the benefits and harms of alternative treatment options. Health plans may also consider the cost of services.

By using clinical pathways, health plans may predict the cost and course of patient care episodes, while also potentially reducing existing, costly treatment variations. Clinical pathways may also be a valuable tool for other stakeholders, such as providers, in managing their risk in value-based contracts by helping to control costs and meet quality metrics.

Data is used both to inform care pathways by minimizing care variation and managing costs as well to monitor adherence to clinical pathways. Stakeholders, including physicians, nurses, and quality managers among others, who lead the clinical pathway development process note it is beneficial to involve physicians in the process due to their deep knowledge of certain therapeutic areas and to increase pathway adherence. Health plan involvement in clinical pathway development varies across the industry. Plans drive the deployment of utilizing clinical pathways by working with third-party vendors to establish the pathways, provide input on the financial incentives that are tied to provider adherence, and monitor adherence to the pathways.

Due to the number of resource needs that are associated with contracting with a third-party vendor, surveying physicians and other clinical staff for therapeutic-specific input, and establishing linked financial incentives, upfront costs for clinical pathway development may be substantial. Further, available evidence of the impact of clinical pathways on care delivery and costs is limited.

Population Health Management – More Sophisticated Practice /

“Monitoring key diabetes metrics is a classic example of successful population health management where the health plan and provider use clinical data to improve individual health and wellness.”

Executive Vice President,
Healthcare Data Innovation Firm

Health plans are increasingly turning to population health management for improved care coordination, provider-patient engagement, and patient outcomes, all while controlling costs through targeted, preventive services. Within population health management, many health plans continue to take a traditional disease management approach, which is claims-based and relies on physician referrals. This approach helps health plan management systems provide patients with specialized support regimens. Over the long-term, population health management has the potential to decrease overall costs for the health plan’s patient population by implementing interventions in a more timely, proactive manner that can reduce subsequent, higher intensity resource use (e.g., inpatient and ED services).

Population health management typically includes some level of integrated patient data. This requires data analysts who can track patients with a particular condition and integrate outpatient, hospital, laboratory, and pharmaceutical claims. Care information then needs to be relayed to the clinical staff including physicians, case managers, home health and post-acute care staff who create hospital discharge or transitional care plans, conduct follow-up, and/or directly monitor the patient’s status. Further, non-medical staff, including social workers and care navigators, may provide direct patient support and can help address other, non-medical issues, such as transportation and psychosocial needs. In more sophisticated population health management analyses, data beyond claims such as the results of the services (e.g., lab tests) and clinically rich EHR information may be needed.

Significant short-term costs are associated with the software and data analytics infrastructure used for population health management. In addition, ongoing costs include clinical staff time allocated to population health management activities versus regular clinical activities, as well as additional, non-clinical support staff such as care navigators. Population health management may require a longer time horizon to realize the treatment benefits than other use cases described in this brief. Therefore, health plans may face operational complications due to patient churn, whereby the benefits of more coordinated care are not realized by the current health plan.

Network Design – More Sophisticated Practice /

“Using patient data to identify clinician outliers, both high and low performers, can help plans reduce costs and improve quality of care.”

Senior Medical Director,
National Health Plan

Health plans may also strategically engage in provider network design to build preferred, high-performing networks that select physicians and other sites of care based on quality, cost, and occasionally patient satisfaction criteria. The redesigned network can provide patients with access to cost-effective, high-quality care within a localized region, while reducing administrative burdens potentially associated with multiple vendors. To this end, health plans may negotiate rates with providers, in addition to creating incentives for additional, value-added case management activities.

Network design may require clinical, analytic, and contract negotiators, who help establish the parameters of the contract. First analysts review providers' claims data to assess and stratify low- and high-performing providers for purposes of formulating a preferred-provider network. Second, network design requires contract negotiations that establish the parameters of the contract and may build in incentives and penalties associated with health care quality and cost. Due to sophisticated data analytics that are required, as well as the complex, ongoing negotiations conducted by multiple stakeholders, upfront resource requirements for provider network design are substantial, but returns should exceed these investments.

In addition to any benefits associated with managing primary care over-ordering and specialty outliers, network design may be particularly beneficial for helping acute care providers manage post-acute care utilization and other post-discharge costs. Effective network design requires various combinations of data inputs from claims (e.g., office visits, pharmacy, and acute care facilities), laboratory results, and patient satisfaction. Although most plans are engaged in some type of network design, some conduct it in a more frequent and robust manner.

Some plans are proceeding cautiously in network design due to a number of issues. First, by virtue of creating a preferred network, some providers can be excluded from networks which may reduce patient choice. In addition, some payers suggest that to remain competitive, the network must include certain providers, which might otherwise be left out. Providers seeking preferred network inclusion may adequately address identified performance opportunities; however, other contract issues may preclude participation. Finally, preferred networks can create challenges for patients who may be unaware of which providers are included within the network.

Treatment and Medication Adherence – Routine Practice /

“Using historical claims data, treatment adherence programs can identify patients who are prescribed a medication, yet are not refilled as anticipated. Health plans often mail, text, and call those patients to remove barriers to care.”

SVP, Healthcare Data Analytics Firm

Monitoring treatment and medication adherence is a relatively common patient data-driven activity in health plans. Health plans review claims data to identify patients who may be at risk for non-compliance with prescribed treatment and medication regimens and target those patients with appropriate outreach and care management programs. Health plans have found value in decreasing the costs through reduced emergency department utilization and inpatient admissions associated with treatment and medication non-adherence. In addition, some health plans have demonstrated an ability to improve the overall health, wellness, and clinical outcomes as a result of patients completing prescribed therapeutic regimens.

Treatment and medication adherence programs involve analysts and programmers who review claims to identify potential issues with adherence. Real-time alerts may inform physicians, nurse practitioners, and pharmacists who help address behaviors to adherence. Lastly, clinical and non-clinical call center staff contact patients to help resolve barriers and encourage adherence. Over the short-term, medication adherence programs require additional infrastructure investments for data analytics, patient outreach, and follow-up. Because patient behavior can be difficult to influence, health plans' success with treatment and medication adherence programs vary widely.

The data-related challenges that health plans face in encouraging medication adherence include: provider misdiagnoses and/or subsequent miscoding of the diagnoses; and claims data lags, which prevent real-time coding corrections and timely data-driven insights. Information about adherence is often not available at the point of care, or is available with a significant lag, potentially greater than three months, after the missed treatment or non-adherence event occurs. Better data quality can be leveraged to address these concerns.

Utilization Management – Routine Practice /

“Utilization management identifies inappropriate and overutilization of tests and procedures to reduce waste and improve quality and value.”

Medical Director,
Regional Health Plan

“Health plans have used data to identify overutilization of certain testing procedures (e.g., MRIs and head CTs), and then identify physicians that are outliers regarding utilization in these areas. Health plans work with these physicians to drive down utilization, which may be excessive and provide limited to no additional value.”

Chief Medical Officer,
Regional Health Plan

Health plans routinely conduct utilization management with an aim of directing care toward the most appropriate and efficient products and services. Utilization management can include processes such as prior authorization, step therapy, drug utilization review, evaluation of intensity of service and severity of illness, and quantity limits. Historically, utilization management has benefited health plans by decreasing costs and improving organizational financials, through use of lower-intensity services. In addition, utilization management can help health plans monitor for potential fraud or system abuse. Patients, also, may derive benefits from health plan utilization management by moving from acute care to often more comfortable home-based care settings or by improved medication efficacy monitoring.

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Data analysts establish algorithms to flag targeted services or treatments. Flags may be monitored in real-time and reviewed by physicians, nurses, or pharmacists. Utilization management has infrastructure requirements in terms of data analytics support and clinician outreach and follow-up. Although almost all health plans conduct some form of utilization management, capabilities and activity level varies across plan size, geographic, and patient mix. Most health plans rely on prior claims or hard utilization management edits (e.g., all patients receiving a particular therapy or diagnosis). Some have more sophisticated data analytics, which pull prior treatment, comorbidities (e.g., recent heart attack or presence of diabetes therapies), or lab test results to bypass or initiate utilization management requirements.

To conduct utilization management, health plans may face challenges from the accuracy of claims data and availability of patient information. Claims data inaccuracies can originate from several sources including typographical errors, inappropriate diagnostic code application, or a misunderstanding of coding definitions, among others. The data inaccuracies may compound other downstream, health plan reporting requirements and can increase staff time review and subsequent appeals. In addition, claims data may not represent all of the information required to identify inappropriate or overutilization of tests. For example, some screening tests may be inappropriate for some patients, but appropriate for other patients based on features not typically available in claims data (e.g., family history or other disease severity). In some cases, utilization management may delay patient access to higher-cost therapies or services that may prove effective. Some health plans require patients to try a range of alternative, lower-cost therapies prior to more expensive treatment options in order to manage the overall cost of care including out of pocket costs to the consumer including premiums, cost sharing, and deductibles.

Potential Challenges, Facilitators, and Opportunities for Misuse /

As the use cases above demonstrate, there are ongoing opportunities for health plans and other stakeholders to address in using patient data to improve care.

One frequently cited challenge among interviewees is the fundamental disconnect and lack of interoperability between data that is either stored within or outside of an EHR. In response, one interviewee suggested that the ideal solution would integrate both claims and EHR data for patients in a single, point-of-care presentation that would provide a physician with a comprehensive, real-time view of a patient's conditions and medical status. This would then enable the physician to identify any outstanding needs or "gaps" in care that a patient may have which the physician could then fully document the resolution of within the same clinical workflow.

Another challenge to a strong flow of data is sometimes resident within the health plan – in identifying the sponsorship and leadership of data related activities. Innovations through patient data can require the participation of a broader audience beyond the clinical teams. Representation from operational and financial lines of business can accelerate designing novel applications for patient data assets.

In contrast, there are notable facilitators of patient data analytics, including the progression towards tailored solutions embedded in EHRs. Embedded solutions help physicians meet documentation requirements and improve the data interoperability and exchange. These increased capabilities have helped reduce physicians' administrative burden.

One common concern among interviewees centered on the potential of using claims-based, patient-level data to risk-stratify patients and penalize them for certain characteristics (e.g., non-medical related). Underlying the concern is that robust data could be used for purposes adverse to patient interest – such as increased insurance rates, decreased benefits or insurance coverage, or even the denial of insurance coverage which is currently prohibited by law.

Interviewees had varying views on the ethics of penalizing patients for certain characteristics and behaviors. Notably, they often expressed that there was a "line" that distinguished between what types of behaviors could or should not be discriminated against. For example, one interviewee thought the practice of charging a patient more for smoking is permissible while thinking that it was probably a misuse of data to a penalize patient for not exercising.

Despite these concerns, there are a growing number of organizations identifying patients with certain attributes that may be considered "high-risk," and stratifying them accordingly. Overall, even if health plans charge more for certain characteristics or behaviors, there was a consensus that health plans should restrict access to services only in cases where there are clinically appropriate standards such as described earlier underutilization management protocols.

Potential Future Use Cases /

While the health plan industry's ability to use data in novel ways develops at a rapid pace, several themes emerged relative to the possibilities offered by patient data for future endeavors.

Risk Management:

Increasingly sophisticated data modeling will help shape health plan networks to optimize quality and costs. This may also guide the design of complex provider networks that account for various medical and non-medical factors within a local geography. Improving health plans ability to manage risk may increase their capability to support care delivery and innovation. In addition, documentation of patient care can help to reflect the actual condition of patients for appropriate risk-based Medicare reimbursement.

Provider Engagement:

Embedding tailored solutions into the EHR clinical workflow, which merge the EHR's data with data from external sources, may enable physicians to readily review a patient's fully comprehensive set of clinical data, including inpatient and outpatient diagnoses, laboratory results and prescription orders, and progress notes. By broadening the physician's view beyond data recorded in the EHR, the physician is better positioned to identify gaps in care. The physician could then address the care gap in a timely manner and close it within the same EHR workflow. Other embedded solutions are providing physicians with routine, convenient access to review their data in performance dashboards relating to quality and risk. Lastly, health plans may aspire to use nearly real-time data that helps generate real-time prompts for physicians and patients about medical and non-medical factors (e.g., medication adherence, blood pressure, pollen count).

New Data Layering:

Incentivizing patients to utilize wearables and remote monitoring devices is a popular consumer trend, although there is very limited data on the effectiveness of these devices. To generate meaningful results on whether these devices positively impact patient's health behaviors (e.g., walking) and vitals (e.g. HbA1C levels), more data needs to be systematically collected and analyzed over the long-term. Lastly, there is a growing interest within the health plan industry to link disparate data sets which integrate medical and non-medical factors impacting health (e.g., heat waves) from various sources (e.g., Nielsen, Google, and Quest Diagnostics).

Smart Utilization Management:

Health plans use a complex algorithm to monitor patients' conditions proactively and identify appropriate therapies and services as needed. If there is an identified gap in care, such as a missed physician wellness visit, the health plan may arrange for a case manager or nurse to intervene and work closely with the patient to close this gap in care. As a result, health plans may reduce patient abrasion, which may occur in conventional utilization management, by closely working with patients to more proactively identify and address their care needs. Notably, some plans are already using smart utilization management, reflecting their most advanced capabilities in patient data analytics to monitor their patient population and shape care delivery.

Conclusion /

Health plans have access to significant information with the potential to transform care delivery through clinical and claims data. As plans engage in activities aiming to improve the quality of care while reducing the cost of care, opportunities to amplify the impact of patient data will increase as multiple stakeholders converge to address challenges together and to ensure that data use is advanced to improve patient care.

As described in each of the use cases, one of the key limitations to successful use of data stems from the labor (e.g. analysts, statisticians) required to make sense of various datasets within health plans. Another limitation surrounding the application of patient data to novel solutions lies in the internal sponsorship and leadership of data initiatives within health plans. Many of the described use cases, whether a commonplace or novel activity for health plans, only become beneficial to patients if the outcome results in lower premiums/costs or have a direct impact on health and wellness.

By using patient data to establish or improve competitive advantages in the market, health plans are able to retain existing and attract new members. Through improved data quality, increased linkages across data sets, integration of analytics into provider workflows, and alignment of financial incentives, patients will be the ultimate beneficiaries of these challenging and innovative efforts.

About Avalere

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Avalere Health

An Inovalon Company
1350 Connecticut Ave, NW
Washington, DC 20036
202.207.1300 | Fax 202.467.4455
avalere.com

About NPC

The National Pharmaceutical Council (NPC) is a health policy research organization dedicated to the advancement of good evidence and science, and to fostering an environment in the United States that supports medical innovation. Founded in 1953 and supported by the nation's major research-based biopharmaceutical companies, NPC focuses on research development, information dissemination, education and communication of the critical issues of evidence, innovation and the value of medicines for patients.

NPC

1717 Pennsylvania Ave NW, #800
Washington, DC 20006
202.827.2100
www.npcnow.org