



# ActiveHealth Management CareEngine®: Advancing the Cause of Evidence-Based Care

New study demonstrates better insights, greater  
engagement and enhanced cost savings<sup>1</sup>

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# MEETING A PRESSING NATIONAL CHALLENGE

While the health care industry grew by only 3.7 percent last year, total direct health care expenditures still exceeded \$3 trillion.<sup>2</sup> Per capita, the United States spends the most on health care in the world,<sup>3</sup> yet our population's health continues to decline, with approximately half of all adults (117 million people) suffering from at least one chronic condition. Meanwhile, out-of-pocket costs continue to rise, with the average deductibles having risen 70 percent in the last seven years (adjusting for inflation).<sup>5</sup> Yet despite all of this, it is estimated that appropriate, evidence-based care is used only about half of the time by physicians.<sup>6</sup>

As a result, health care today is undergoing a profound shift from "volume" to "value." Fueled by government reform, this new paradigm emphasizes solutions that promote clinical excellence, affordability, efficacy and higher patient satisfaction. To achieve these goals, many employers and providers are turning to computerized clinical decision support (CDS) programs that sift through pertinent health care

data and help both physicians and patients identify potential opportunities for improving care and reducing costs. Not only do these technologies "help clinicians remember to do what they would like to do anyway, making it easier for them to make the right decisions,"<sup>7</sup> they can accelerate the dissemination of evidence-based knowledge. The Affordable Care Act (ACA) highlights these technologies as important ways to "facilitate data collection and ensure patient-centered, appropriate care."<sup>7</sup>

ActiveHealth Management has been a leader in this field from the start through its proprietary CareEngine technology, which allows us to monitor some 1,200 health opportunities and track the progress of a patient's treatment against any identified opportunities. Starting in 1998, we pioneered the transformation of evidence-based literature into clinical algorithms leveraging many data sets in order to promote knowledge dissemination and close the gaps in evidenced-based care. Today we continue to offer innovative

solutions in the field of population health management for more than 22 million people every month.

To measure the impact and potential of CareEngine, we recently conducted a large-scale retrospective study with data from almost 2 million insured health plan members over a two year period. To help focus on the impact of CareEngine, and in an effort to avoid measuring impacts from other health benefit programs, members in disease management programs were omitted from the study. The results were impressive. In the study group of 131,670 people, we saw an 8 percent reduction in emergency department (ED) visits and hospital admissions, average savings of \$2,295 for each resolved Care Consideration and an improvement in 8 of 13 important clinical quality indicators.<sup>†</sup> The improvements were achieved by communicating patient-specific, evidence-based information to physicians and patients, helping both avoid unnecessary or costly services, and encouraging preventive and needed care.

## Impact of ActiveHealth®'s CareEngine over the past decade



**64 million**  
individual lives monitored



**8.1 million** health  
improvements achieved



**\$8.4 billion** in estimated  
savings for ActiveHealth clients\*

8% 

**Reduction** in ER visits  
and hospital admissions



Average savings of **\$2,295** for  
each resolved Care Consideration



Improvements in **8 of 13**  
important clinical  
quality measurements

### The ActiveHealth CareEngine: Why should you care?

Clinical knowledge is growing at an unprecedented pace, fueled by new technology and research techniques. At the same time, the volume of information about patients—including claims, lab results, pharmacy data, electronic health records (EHR), personal health records (PHR), care management data and medical devices—continues to increase. This swelling cascade of data, which can be difficult for physicians and patients to handle, demands a sophisticated technology developed by a dedicated team of clinicians and based on well-established practice guidelines that helps sort through it all in a meaningful and helpful way.

“Thank you so very much for all the notices you have sent me about the medicines I take. The biggest is the warning about Cipro and it causing seizures. That was what was happening to me, and the neurologist wasn’t even aware of it. Thank you again. Keep up the good work.”

– CareEngine user

That technology is the ActiveHealth CareEngine. A highly intelligent monitoring system, it tracks the patient’s health status, scans multiple complex medical and consumer data sources, and sends Care Considerations to help physicians and their patients identify opportunities to take evidence-based action. All of this helps support better, more appropriate care and lower costs consistent with the goals of health care reform.

### Study Results: The impact of CareEngine on quality, utilization and costs

#### Objective:

To evaluate the efficacy of CareEngine, in 2013 ActiveHealth completed a large, retrospective and matched controlled cohort study that tested our ability to help improve clinical, utilization and financial outcomes in a geographically diverse population. The study focused on clinical indicators of care quality, use of hospitals and EDs, and expenditures. These are major concerns of employers who fund health benefits, and could help demonstrate the value of the CareEngine service for health plan sponsors and accountable care organizations (ACO). An earlier randomized controlled prospective

study, published in *The American Journal of Managed Care* in 2005, had already demonstrated how CareEngine can help improve resolution of care gaps, prevent related hospitalizations and lower cost.<sup>8</sup>

#### Design:

The population of the 2013 ActiveHealth study consisted of individuals covered by fully insured preferred provider organization (PPO) plans of a large, national health plan that insured many employers—some of whom had purchased the CareEngine services and some of whom had not. The goal was to retrospectively capture data from two consecutive years, including adjudicated medical and pharmacy claims, lab results and eligibility files. Members who were enrolled in disease and care management programs were excluded to avoid potential confounding variables that could skew the results. Individuals were included in the study if they had at least 12 months of continuous insurance eligibility, both before and after implementation. This minimum data requirement was important to reduce the effect of increased utilization from newly insured individuals and to make sure there was enough data available to accurately detect

## ACTIVE INSIGHT

### Care Considerations—the “voice” of CareEngine

The alerts produced by CareEngine are called “Care Considerations.” These letters sent to a patient or physician communicate a possible opportunity to improve the patient’s health according to accepted standards of care, thus identifying a potential gap that may have been overlooked. Care Considerations also help spread the awareness of established medical guidelines and encourage increased use of evidence-based services by providing information on important drugs, tests or other services. This is ActiveHealth’s proven, proprietary technology which synthesizes medical claims, pharmacy, lab, biometric, self-reported, financial and consumer information in order to help physicians and members directly impact a member’s health outcome.

gaps in care. The treatment study population consisted of 163,000 individuals, of which 131,670 (or nearly 81 percent) were appropriately matched with the control group of 1,676,400 individuals. The control group population was intentionally large so we could find people who closely matched the individuals within the study population.

A rigorous process was used for this matching, including age, gender, number of hospital and ED visits before the study, clinical conditions, health insurance

product used, geographic region and cost group. (Each person was placed in a “cost group” based on his or her total health care costs—both out-of-pocket expenses and those incurred by the employer—in the 12 months prior to having access to CareEngine.) We took care to neutralize important observable differences between the treatment and control groups in order to focus on the impact of CareEngine.

#### Methodology:

The findings presented were derived through a highly exacting methodology. At each step of the process, we measured and reported the outcomes of our efforts to validate they were on track and credible. All claim savings were substantiated by plausibility metrics. Under the study methodology used, there could be no savings without impact to utilization, and no impact to utilization without a reduction of risks, resolution of Care Considerations and/or improvement in clinical outcomes.

#### Findings †

The study showed that the population exposed to CareEngine’s CDS communications had improved outcomes for several important clinical indicators, reduced ED and hospital visits and overall decreased cost of care.

- Improvements in **8 of 13** important clinical quality measurements
- **8 percent** reduction in ED visits and hospital admissions
- **Average savings of \$2,295** for each resolved Care Consideration

We also identified other improvements when compared to our 2005 study. Much of this was due to the doubling of our library of evidence-based rules from 450 to 900 between the two studies. CareEngine’s technology and rule structure was also enhanced to improve Care Consideration sensitivity, allowing for greater identification of gaps in care and contributing to a 79 percent improvement in Care Consideration compliance over the 2005 study.

#### The key to CareEngine’s success: Capturing the “total picture” of health

CareEngine’s success in the 2013 study is the result of its ability to provide a broad view of a person’s health, using a full range of available data. Unlike other data management technologies that focus either on claims or clinical data, CareEngine has the ability to draw on

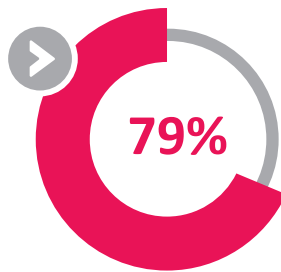
## ACTIVE INSIGHT

### What is Care Consideration “compliance”?

When a patient or physician follows through to address a possible gap identified in a Care Consideration, that is “compliance.” And the results can be profound. When one of our members received a Care Consideration warning that her seizures could be a possible side effect of Cipro, she took it to her neurologist, who was not aware of this side effect. Our Care Consideration prompted the member to work with her physician and switch to a new medication, which changed her life.



**higher**  
Care Consideration  
identification



**greater**  
Care Consideration  
compliance

both claims and clinical information from EHRs to provide a holistic picture of the individual. This means, for example, that CareEngine knows not only if a patient was prescribed a particular medication, but it also knows if that prescription was filled; when it was filled; and if the patient got a refill.

CareEngine also captures patient-entered data, such as information from a PHA,

as well as data from care managers such as nurses and health coaches. This patient care management information is married to claims and clinical data to produce even deeper insights and a more thorough evaluation.

Data is collected and assessed in timely fashion. Lab and pharmacy claims data is typically received in fewer than 30 days—and often fewer than 15 days—after the service is provided. Claims are often analyzed in fewer than 15 days after being received. In the event of a severe, drug-related patient safety issue, such as a drug recall, we can build and launch a new CareEngine rule within 48 hours.\* This nimble processing of different kinds of data allows CareEngine to quickly identify possible gaps in care, a capability which the 2013 study showed is extremely valuable in a complex and rapidly moving health care marketplace.

#### **More comprehensive data leads to savings**

CareEngine's ability to create a broad history of the patient means that the Care Considerations it communicates are more comprehensive in scope than CDS programs that use more limited data sets. There are two critical components to the effectiveness of any CDS program:

1. The ability to leverage all available data and create a longitudinal record for the patient that goes beyond the four walls of one practice.
2. The ability to build the clinical rules with weighting applied based on the source of the data and high specificity to limit unnecessary care alerts.

In a limited Institutional Review Board (IRB)-approved review of charts for 400

cases at one hospital in 2008, the study found that the CareEngine accurately identified a condition 98 percent of the time when compared to the EHR. The study also showed that 91 percent of the interventions recommended by the Care Consideration were accurate when compared to the EHR at the time the Care Consideration was issued.<sup>9</sup> Such accuracy has helped CareEngine achieve a compliance rate that is 138 percent higher than spontaneous compliance.<sup>9</sup> It's important to note that this kind of validation is not possible with EHR data alone; it is the combination of EHRs and claims that enables CareEngine to know if an individual complies with a recommendation. CareEngine's ability to generate appropriate Care Considerations

#### **The CareEngine Value Story**

"This new study of the CareEngine convincingly demonstrates the simplicity and genius of the system. CareEngine identifies a gap in evidence-based care. It sends a message to the provider and patient. When the gap in care is closed, this helps lower the chance of an adverse event occurring. This is reflected in the lower ED and hospitalization rates. When adverse events are eliminated they don't have to be paid for and this is the source of savings."

**– Paul Mendelowitz, MD**



## ACTIVE INSIGHT

CareEngine's marriage of claims and clinical data provides deep insights driven by best-in-class analytics that help set it apart in the CDS world.

that promote improved compliance is a key factor in the significant savings seen in the 2013 study.

### CareEngine keeps growing

CareEngine's unique capabilities are continually being upgraded to provide even more precise data gathering. Since its development in 1998, we have been updating CareEngine on an ongoing basis to reflect new, well-established practice guidelines. In 2009, we developed the capability to combine payer claims data with EHR data. Today, in addition to its synchronization of various types of complex data, CareEngine:

- Has the ability to help risk-stratify the population, identify members who are not compliant with quality measures and identify members for care management programs.
- Can combine consumer data with other CareEngine data to segment members based on their propensity to engage or their level of motivation.

CareEngine now includes more than 1,200 Care Considerations, validated by Harvard Medical School, and more than 200 quality measures. Evidence-based sources include medical guidelines from organizations such as the American Heart Association

(AHA) and peer-reviewed journals such as the *Journal of the American Medical Association*.

Each year, we add at least 50 new Care Considerations to our CDS library. The integration of claims data with clinical data sources such as EHRs has allowed us to more finely tune the inclusion and exclusion criteria of the CareEngine rules. Equally important, CareEngine's inherent flexibility permits modification or deletion of existing Care Considerations based on evolving clinical evidence as reviewed by national specialty societies.

All of this has enabled ActiveHealth to respond quickly to changes in evidence or in national-level clinical practice guidelines. When the AHA recently revised its cholesterol guidelines for the use of statins, we responded by integrating the new AHA global risk assessment calculator into CareEngine, helping providers identify high-risk patients who might not have been receiving statins for primary prevention. And when hypertension guidelines for patients 60 and older were updated, we began informing members through CareEngine's Care Considerations about blood pressure targets that reflected the new standards.

### CareEngine is driving better outcomes and reduced costs

Despite a changing landscape, more available information and increased complexity, CareEngine enables customer, physician and member population health management strategies for achieving significant savings and better quality. And CareEngine's capabilities will continue to evolve:

- Our team of specialized clinicians regularly reviews, assesses and compares national guidelines, clinical studies and other evidence to update CareEngine on an ongoing basis to reflect well-established practice guidelines.
- Feedback is incorporated from physicians, members and academia, including globally-recognized centers of learning such as Harvard Medical School.
- Potential impact and strength of evidence are critically assessed.
- Rules and Care Considerations are updated in CareEngine to reflect current health recommendations.



**More than 1,200**

Care Considerations, validated by Harvard Medical School and others



**More than 200**  
quality measures



**50 to 60**  
more actionable  
recommendations  
every year

“As an occupational physician who has personally received a ‘Care Consideration,’ I can testify to the benefit of the program. Review of the Care Consideration by my own physician resulted in a beneficial adjustment to my medications. Thank you, ActiveHealth, for filling an important gap in the provision of current, evidence-based information to patients and their doctors.”

– Brian Davey, MD



## Conclusion

ActiveHealth continues to be a visionary leader in CDS and care management programs, both of which are critical pillars of effective population health management. Our proprietary CareEngine technology is constantly adapting to an evolving health care market in order to support the highest standards of care and promote cost savings for physicians, patients and employers. This ability to support advanced health improvements through synthesis of health data for both individuals and larger populations has kept ActiveHealth on the leading edge of innovation and shown that CareEngine is fully able to meet the challenges of today’s rapidly changing health care environment.

- \* Estimated savings were calculated using ActiveHealth’s proprietary Health Economic Model, which projects the cost savings resulting from Care Considerations resolved or complied with by members and their physicians.
- † Active Health’s clinical decision support services may help you reduce total paid claims for commercially insured members enrolled in a managed care plan, driven by improvements in inpatient, outpatient and professional services costs. Because the structure, list prices, and reimbursement rates vary significantly among health plans, the total savings may vary by plan and implementation of the services with a particular plan may not result in total cost savings.
- ‡ Most CareEngine rules are typically developed, tested and deployed on a cycle that takes less than 60 days.

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**To learn more about the study, or understand how CareEngine can help you achieve better outcomes, contact ActiveHealth at [info@activehealth.net](mailto:info@activehealth.net).**

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## RESOURCES

1. Data from 2013 study compared to 2005 Study: (See Javitt, et al.)
2. Annual U.S. Healthcare Spending Hits \$3.8 Trillion. Forbes. February 2, 2014. Web. <http://www.forbes.com/sites/danmunro/2014/02/02/annual-u-s-healthcare-spending-hits-3-8-trillion/>
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