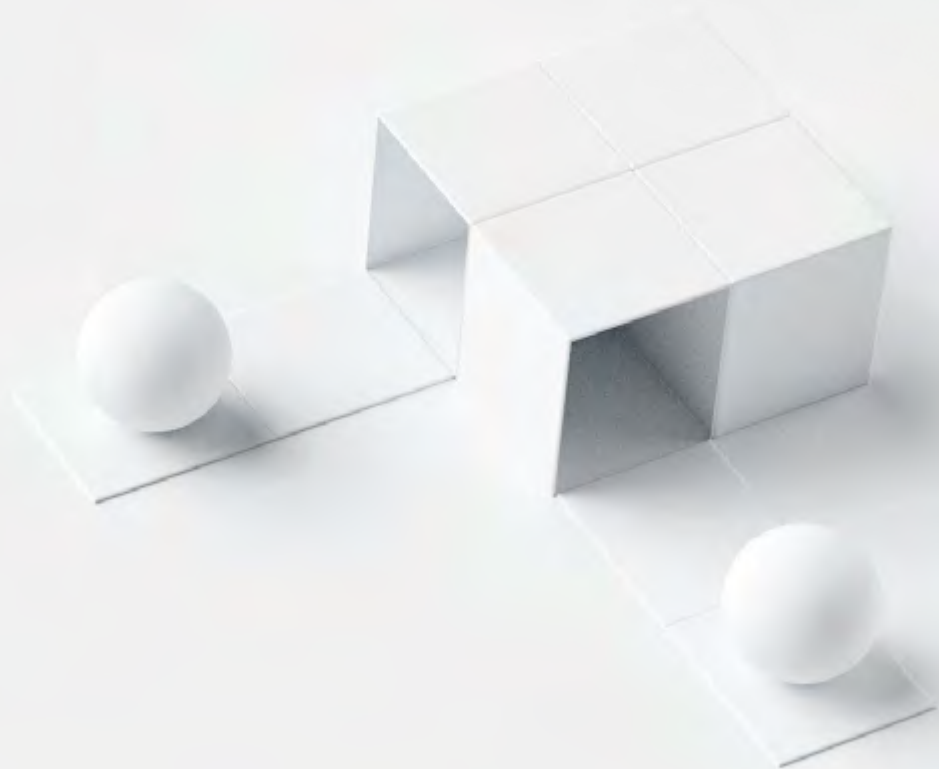


How Diagnostic Robotics

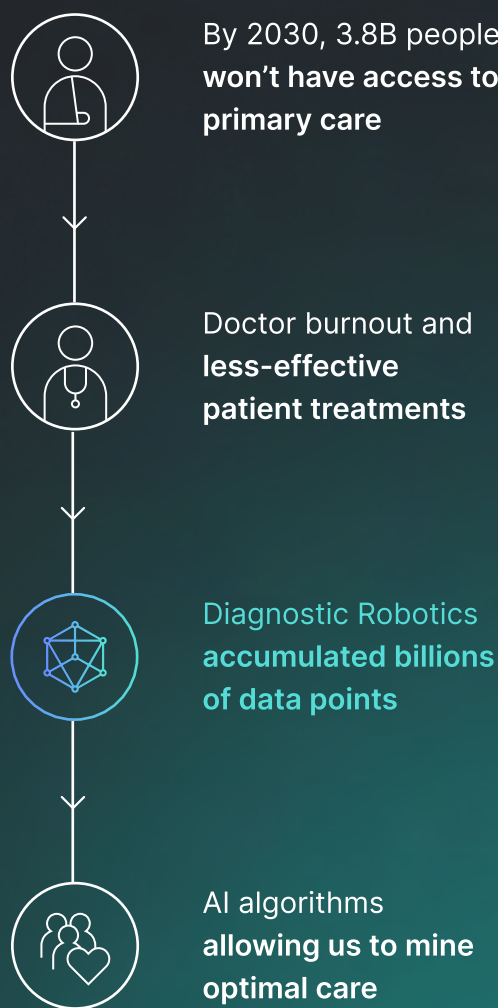
improved Avoidable Emergency Room ROI for a national top 5 Health Plan



Introduction

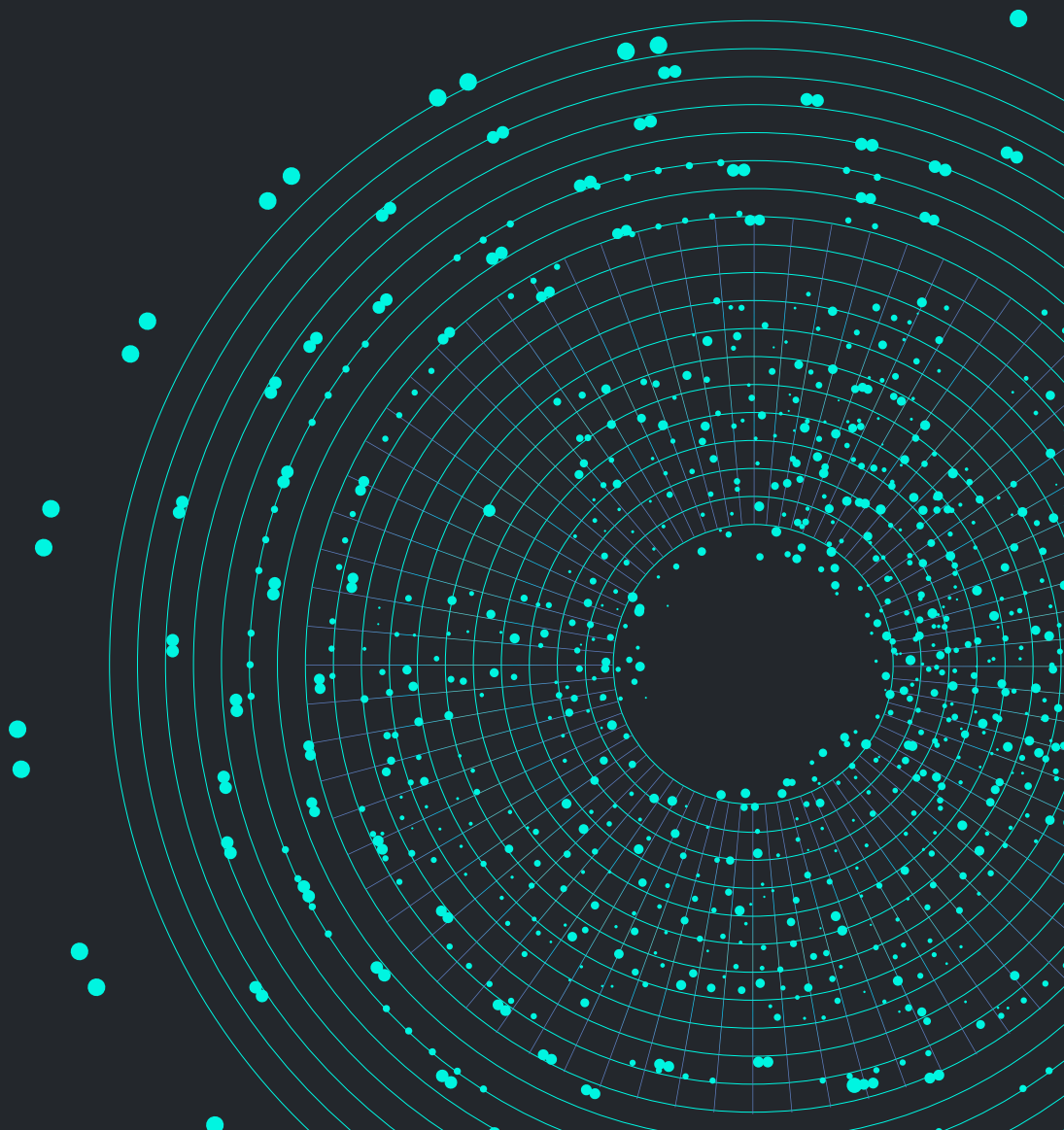
Diagnostic Robotics has brought together tenured medical professionals, leading artificial intelligence researchers, data scientists, and data miners to create **powerful AI solutions for healthcare institutions and organizations**. Trained on tens of billions of medical claims data points and nearly 100 million patient visits, Diagnostic Robotics' solutions are actively in use at several leading US health plans. The company's systems integrate seamlessly into major touchpoints along the patient journey, providing high-value decision support, massively reducing the cost of care, adding efficiency to health plan care management operations, and improving patient outcomes.

By 2030, 3.8B people **will not have access to primary care**¹. This means that hospitals will undertake more burden, causing increased doctor burnout and less-effective patient treatments. But for the last decade, we have accumulated **billions of data points** in the form of historical patient hospital visits and interactions with physicians, allowing us to mine **optimal care pathways** for patients using machine learning algorithms. Our underlying mission is to proactively identify deteriorating patients, clinically triage them and **match them with the right intervention** based on historical success with similar patients.



1. https://pubdocs.worldbank.org/PubDocsError.jsp?err_msg=Document%20is%20not%20available%20for%20public%20viewing

Diagnostic Robotics was approached by the internal data & analytics team of a **national top-5 health plan** (by number of members covered). The health plan was looking for innovative ways to improve direct impact in its care management program effectiveness, while also understanding the value of improved patient outcomes for a 'reputational facelift.' Legacy systems were working, but not providing enough value, and resources were stretched or needed elsewhere. Specifically, the health plan was targeting ways to **reduce avoidable ER visits**, which amount to a **billion dollars in medical costs** for the plan.



Why Diagnostic Robotics?

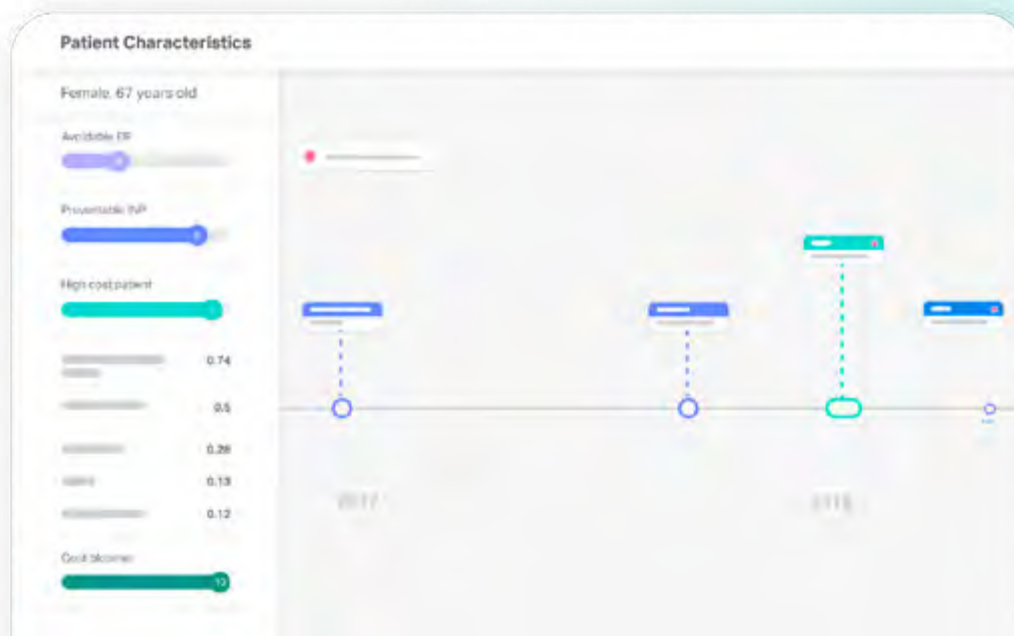
“ For the first time in history, a medical system can study its patients statistically for long periods of time and provide insights originating from big data to better predict diagnosis. The prevention of illness is playing an ever-larger part in the medical ecosystem ”



Kira Radinsky, CEO Diagnostic Robotics

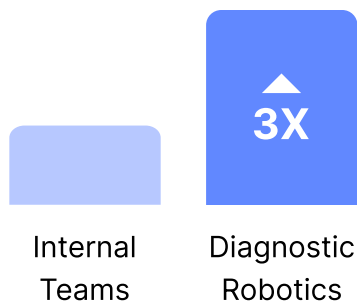
With all of this in mind, Diagnostic Robotics entered a multi-year relationship with the health plan with the goal of enriching population data to provide actionable clinical insights to meaningfully improve patient outcomes and member health and care management ROI as they related to ER visits.

Diagnostic Robotics helped the plan shift from risk-based targeting - focused primarily on which members cost the most today - towards clinically actionable targeting that highlights which members will be expensive in the future. Additionally, we leveraged true intervention matching, where only members who can actually benefit from the specific intervention were engaged – the result was that Diagnostic Robotics was able to reduce the rate of ER incidents for the health plan, leading to tens of millions of dollars in additional cost savings.



How did we do this?

Diagnostic Robotics approaches building precision population health models by first combining best-in-class AI/ML algorithms with deep clinical insights, based on a proprietary data set of over 60 billion medical claims points.



In working with national health plan clients, our proprietary model has led to improvements in accuracy and precision over 3x when compared to internal models alone.

1

SPEED TO IMPLEMENTATION

In working closely with the health plan's data teams, we were able to leverage their claims data, as well as input from other external data, such as social determinants of health, meteorological patterns, and more, and run it through the first iterations of our models within just a few days' time. The importance of being able to integrate quickly was valuable to the plan because it gave them the ability to evangelize the information across multiple involved departments (data, analytics, care management, and others) and ultimately drove faster outcomes.

By leveraging Diagnostic Robotics speed to implementation, the plan could also provide our data science and clinical teams more real-time data when it came to outreach to members, allowing us to optimize the models in real-time as well, driving more accurate results. In fact, due in part to the ease of data integration, **Diagnostic Robotics improved the plan's expected ROI from internal models by nearly 50%.**

2

60B CLAIMS DATA POINTS

A typical claims report will show which members had an ED visit, and what specific claims are associated with it. But traditionally, that same claims report cannot tell you if the visit was avoidable.

Our exhaustive claims data is diversified and anonymized, based on information we receive from regional and national health plan partners, allowing us to optimize our models against more data points than the average internal team, which will typically leverage its own historical data alone.

By tapping into a much wider array of claims data points than any individual health plan (over 60 billion and counting), Diagnostic Robotics is able to look at trends in claims data in order to identify clinically-relevant information – information that can help identify what the definition of avoidable really is, and how to impact it.

The more clinically relevant we are, the better the definition of avoidable is and the higher the likelihood that we can proactively target and prevent ER visits.

3

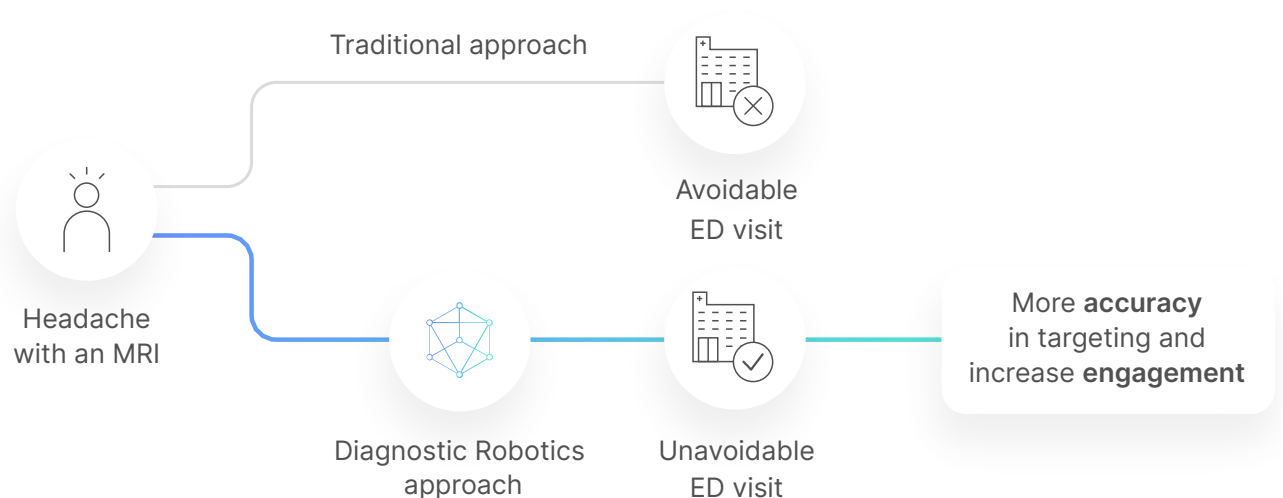
DR'S PROPRIETARY, SPECIFIC, NUANCED, AND NARROWER DEFINITION

Some standard approaches to defining risk, including the well-known NYU-ED model, and some proprietary definitions we've seen implemented in health plans tend to focus exclusively on diagnoses. **Our approach is different.**

Our proprietary models overlay claims diagnoses data with claims procedural data so that we can be far more nuanced about which

ED visits are actually avoidable. By adding procedural data, we can remove ER visits from health plan risk lists that are actually not avoidable at all using a standard definition/classification.

For example, a traditional method may classify a headache with an MRI as avoidable, because the diagnosis is a headache – which on its own could likely have been treated by a PCP; our models pull out the procedural component from the dataset – the MRI – and identify it as unavoidable, improving the accuracy of the definition. This approach not only increases accuracy in targeting, but can increase engagement as well.



When looking across a pool of ER visits that might've been deemed avoidable by other, more standard definitions, we've classified as few as 35% as being truly avoidable – the implication is two fold:

- We can keep more people out of the ER
- We can help drive efficiency with fewer calls, wasted hours and higher ROI for care management teams.

This was true of the health plan we worked with on the avoidable ED model.

The power of more clinically conservative/relevant definitions

When we're more conservative about defining clinical relevance in regards to what constitutes an avoidable ER visit we are able to also highlight a different population than what typical or standard health plan methods would. We can unlock savings health plans are not even aware of today, due to far more liberal and less clinically relevant definitions of risk.

By leveraging the Diagnostic Robotics model, the health plan was able to achieve 34% more potential cost saving while reaching out to 22% fewer people.



The Diagnostic Robotics model's risk population was younger.



The Diagnostic Robotics model's risk population was healthier.



The Diagnostic Robotics model's risk population was visiting their Primary Care Physician fewer times a year.



The Diagnostic Robotics model's risk population was nearly 2x less likely to overlap with other CM programs.

Targeting an entirely different population, especially one that is more accurately and narrowly defined, means unlocking ROI the health plan may not have known existed.

4

IMPROVED RANKING METHODOLOGIES & CLUSTERS, AND EXECUTION

Diagnostic Robotics focuses away from generalized risk, which is what most health plans have traditionally done, to specific, individualized clinical events that can be avoided; we call out these “impactable members” because engaging them drives the highest reduction in ROI for a health plan. Most models use non-avoidable events.

Additionally, we do not rank purely on claims points, we tie components together, such as clinical insights, to paint a more holistic picture of each member, understanding and linking how one event may impact future events and likelihood of an ER visit.

Our ranking methodologies and clusters look at why the member is going to the ER for the wrong reason and then create ways a care management team can impact that member in real time.



The prevention of illness is playing an ever-larger part in the medical ecosystem. For the first time in history, longitudinal historical patients’ data and patient-reported triage outcomes are being combined to predict patient clinical journey with an impactful proven result.



Kira Radinsky, CEO Diagnostic Robotics

5

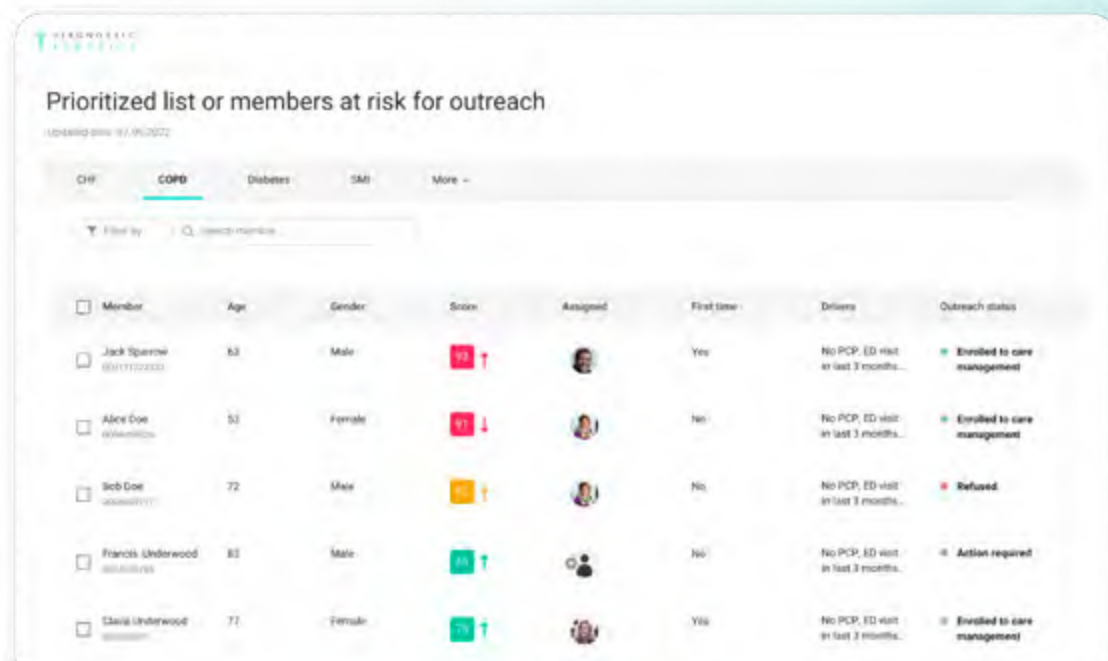
REAL-TIME, IMPACTABLE RISK LISTS FOR HEALTH PLANS

Our focus, and where we have developed proprietary IP, is to call out **actionable** aspects of risk, i.e. what is going on with a member that might be addressed by a health plan care management team or perhaps an external solution- tangible events that can be spoken about with a member and ultimately mitigated.

In the context of avoidable ER with our partner, we broke out risk into the following drivers of why members use/visit the ER improperly or when they don't have to (this list is not conclusive or exhaustive, but illustrative):

- Lack of or nature of their PCP connection
- BH comorbidity
- Tendency to use the ED for telemedicine-treatable conditions
- Tendency to use the ED for UCC-treatable conditions
- Tendency to the use the ED for pain management

By leveraging Diagnostic Robotics' models, the care management teams can be proactive at preventing these kinds of events, improving patient outcomes significantly, while increasing ROI for the health plan.



Prioritized list of members at risk for outreach
Updated on 11/19/2022

CHF COPD Diabetes SMI More -

Filter by Search members

Member	Age	Gender	Score	Assigned	First time	Delivers	Outreach status
Jack Spensie	63	Male	79 ↑		Yes	No PCP, ED visit in last 3 months	Enrolled to care management
Alice Doe	53	Female	81 ↓		No	No PCP, ED visit in last 3 months	Enrolled to care management
Bob Gail	72	Male	85 ↑		No	No PCP, ED visit in last 3 months	Refused
Francis Underwood	81	Male	88 ↑		No	No PCP, ED visit in last 3 months	Action required
Clara Underwood	71	Female	87 ↑		Yes	No PCP, ED visit in last 3 months	Enrolled to care management

Outcomes

As it turns out, the health plan's internal models were aggregating members who were visiting the ER, but with unavoidable incidents. For example, life-threatening wounds, urgent knee pain or a leg sprain. While these incidents may be considered low-acuity, or requiring of nursing care, they are likely not avoidable. **Our models defined risk differently**, looked at truly avoidable ER visits and in turn were able to prioritize which members should be **engaged** with in order to keep them out of the ER and improve care management efficiencies and ROI.

Our process in partnering with the health plan yielded significant results and go-forward opportunities.



4x reduction in avoidable ER cost, from over \$500 to just over \$100 dollars spent per member.



An over 3x improvement in avoidable ER visits.



22% fewer members were included for outreach, significantly reducing the burden on the Care Management team.

“ The Diagnostic Robotics solutions were not only impressive in their ability to identify member populations that we had not identified previously, helping to keep our members out of the ER, but at the same time improved our bottom line. ”

CDO, top 5 national health plan

Conclusion

Diagnostic Robotics is on a mission to transform healthcare and **leverage the future of Artificial Intelligence** to better patient outcomes and improve health plan ROI. We imagine a world where the most advanced technologies in the field of artificial intelligence **can make healthcare better, cheaper, and more widely available.**



Discover how a modern AI solution can drive real ROI for your organization at diagnosticrobotics.com.



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