CASE STUDY

Lightbeam Health Solutions

How Saint Peter's University Hospital Reduced ED Visits 7% by Using AI to Uncover Hidden Social Determinant Needs and Delivering Proactive Patient Care

Background

Saint Peter's University Hospital, a 478 bed safety-net provider located in New Brunswick, Middlesex County, New Jersey, has a clear mission to improve health outcomes among its population, with a specific emphasis on reaching the most vulnerable patients. Healthier Middlesex is a community-based organization who also has a clear mission to reduce health disparities. It conducted community needs assessments giving Saint Peter's a broad understanding of the needs of the community.

Challenges

Social determinants of health (SDOH), such as food and transportation, are key drivers of health outcomes and responsible for up to 80% of the variance of health outcomes. Saint Peter's understood that such factors are important to address before they negatively impact physical outcomes and drive avoidable utilization and cost. Saint Peter's had an established SDOH screening process, but needed a way to identify SDOH risk factors at scale and deliver at the point of care.

These data points are customarily not available to providers at the point of care. Saint Peter's needed to be able to prioritize patients based on risk to efficiently match patients to appropriate interventions. If Saint Peter's didn't have a way to get this information to providers at the point of care, how could they effectively serve a growing and predominantly low-resource, diverse population?

Achieving Goals

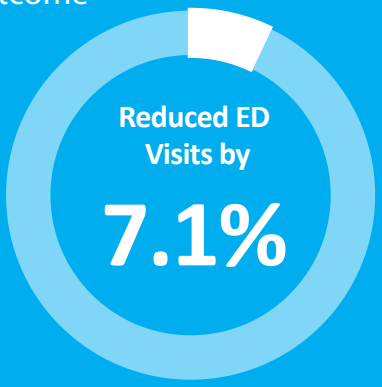
Saint Peter's implemented vendor Lightbeam's health equity AI model to identify individual patient's social determinant risk factors and recommend appropriate interventions.

Saint Peter's partnered with Lightbeam to achieve three goals:

1. Identify high-needs patients and their specific social determinants of health
2. Increase staff productivity and impact through efficient referrals to Saint Peter's existing social service programs
3. Measure and report the clinical and financial impacts of their health equity and charity care work to meet charity care reimbursement objectives and ensure financial sustainability; this includes reaching out to and serving the most vulnerable patients

Saint Peter's University Hospital
New Brunswick, NJ

Outcome



"Through partnerships and grant funding, we had existing programs to support food accessibility and transportation but not a way to efficiently identify which patients needed them. Lightbeam AI identified patients with food and transportation needs, empowering our clinical team to make efficient referrals to existing programs, ultimately enabling us to more effectively serve a growing and predominantly low-resource population."

Ishani Ved, MHA, CPHQ, FHELA,
Director, Transformational Population Health & Outcomes, Saint Peter's Healthcare System

Solution: Predicting Next 90-day Utilization

Lightbeam AI's model, named, "SDOH Individual" could predict the patients who are on a trajectory towards high utilization in care (IP or ED visit in the next 90 days) based on social vulnerability data alone.

The model lists the top 10 SDOH risk factors for a patient, along with the top 5 recommendations to reduce the patient's risk the most. Saint Peter's care team reviewed the risk factors and recommendations in order to mitigate high utilization.

The model has minimal client data input requirements, for example, it does not require clinical data. Yet, it can predict health utilization and social vulnerability with precision, enabling care teams to have a large impact on health outcomes.

Model Output

Socioeconomic Risk Factors

- Poor indoor air quality
- Low household income
- Low transportation availability
- Education likely limited to high school
- Lack of other adults in household

Recommendations

- Educate patient on integrated pest management to reduce risk from pests
- Educate patients with asthma to plan activities when air quality is high
- Explore transportation barriers to care
- Provide culturally relevant health services
- Assess for social support system

Saint Peter's Deployed AI Insights at Point of Care

One key aspect of Lightbeam's collaboration was the integration of data with patient scheduling systems. AI automatically assessed the week's upcoming patient appointments from the patient scheduling data and identified likely individual SDOH risk factors. Each week, the clinical team was able to identify risk factors (such as food insecurity and transportation) to align with existing support programs to benefit patients coming in for appointments. Staff referred patients to the food and general market, and transportation program, addressing patients immediate needs and increasing utilization for the programs.

Regular communication and collaboration within the teams were also critical components of Saint Peter's workflow. Team members regularly discussed patient cases and collaborated with providers, social workers, and the Managed Care team every day in the medical record and in person to convey what the screening and AI model found. This collaborative approach ensured that interventions were coordinated and aligned with the organization's broader care management goals.

1. Data Integration & SDOH Risk Factor Identification

AI automatically assessed the week's upcoming patient appointments from the patient scheduling data and identified likely individual SDOH risk factors and recommendations

2. Risk Segmentation

AI segmented patients into high, medium, and low risk categories

3. Support Alignment

Saint Peter's care team narrowed in on identified risk factors (food insecurity & transportation insecurity) that could be addressed with existing support programs

4. Patient Referral

Saint Peter's care team referred patients to available resources, addressing needs and increasing SDOH program utilization

Community Partnership, Health System, and Vendor Collaboration

Collaboration was instrumental in enabling Saint Peter's to address multiple SDOH needs within the community. The process began with Healthier Middlesex identifying broad challenges in the community health needs assessment that Saint Peter's used to write a grant aimed at receiving resources to address the identified issues. Subsequently, a for-profit entity provided a grant specifically focusing on addressing transportation challenges.

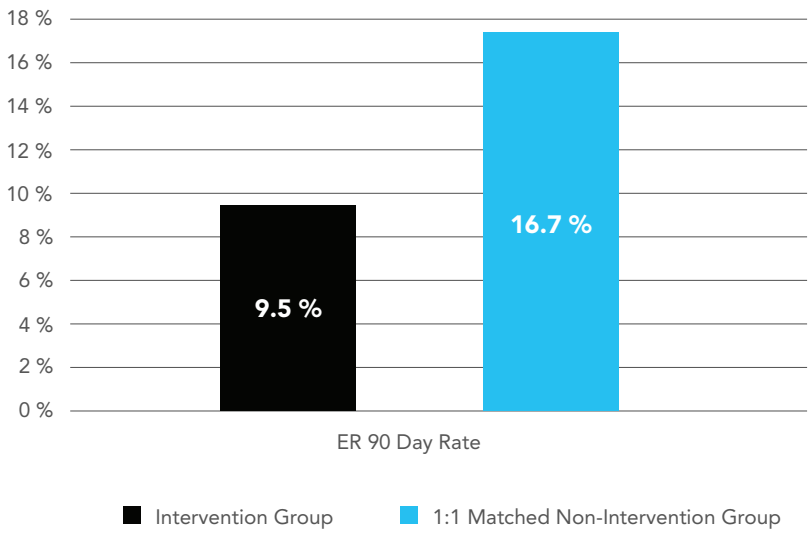
Lightbeam's AI played a crucial role in identifying patients most likely to require transportation assistance, further enhancing the projects effectiveness. With this data-driven approach, Saint Peter's was able to efficiently connect patients with transportation resources, ensuring they could access essential healthcare services despite transportation barriers.

Saint Peter's took proactive measures to enhance patient care and take action based on the AI recommendations:

1. Hired bilingual health educators to bridge language barriers and ensure inclusivity.
2. Established a food market, initially serving 20 patients and later expanding to 50 families (200 individuals) monthly.
3. Conducted a comprehensive health needs assessment with Healthier Middlesex, revealing barriers like limited access to affordable transportation.
4. Secured grant funding from a for-profit transportation partner to set up a transportation program
5. Integrated SDOH screenings into routine care using PRAPARE for outpatients and inpatients.

Results:
Saint Peter's Realized a 7.1% Absolute Reduction in the ER Visit Rate Compared to a Matched Control Group

To evaluate the impact of the Lightbeam AI's SDOH Individual model and 90-day ED patient identification and recommendations, and subsequent intervention from the Saint Peter's care team, we conducted a matched control analysis using a statistical software. The intervention group represents patients who were identified by the model as a high or medium risk patient likely to admit within the next 90 days and received screening/intervention from the Saint Peter's care team. The 1:1 matched non-intervention group represents patients matched on age, gender, and risk category who were identified by the model, but not screened or intervened by Saint Peter's care team. The analysis found that patients in the intervention group had a 9.5% ED 90 day visit rate while patients in the control group had a 16.7% ED 90 day visit rate, representing a 7.1% absolute reduction in the ED 90 day visit rate.



Next Steps

While still early in the initiative, Saint Peter's has achieved promising results. Anticipated outcomes include reductions in appointment no-show rates, missed appointment costs, and increased capture of Z codes for comprehensive documentation. Saint Peter's is confident in the long-term impact of their patient-centered, data-driven approach on patient access, outcomes, and financial sustainability.

To learn more about Lightbeam AI, visit:
https://lightbeamhealth.com/healthcare-ai/

Lightbeam Health Solutions