

IDENTIFYING VHD PATIENTS IN URGENT NEED OF CARE



Mpirik
Cardiac
Intelligence™
Platform

How artificial intelligence and data mining helped
St. Francis Hospital expand care to more patients.

Mpirik

Medtronic
Further. Together

MORE THAN 120,000 SEVERE AORTIC STENOSIS PATIENTS ARE **CURRENTLY GOING UNTREATED.**^{†1}

Unreached and undertreated

An estimated one-third of patients in the United States who meet the AHA/ACC Guidelines criteria for severe aortic stenosis don't have a guideline-recommended treatment plan.² Clinical data suggests myriad reasons, including echocardiogram findings that are misclassified due to complex cardiac anatomy, or referrals that are delayed.³

Whatever the reason, many hospital systems have valvular heart disease patients in their system who remain untreated or undertreated. And these hospitals are usually unaware of the extent of the issue.



Seeking answers at St. Francis

According to Kristin Pasquarello, M.P.A.S., PA-C, Administrative Director of The John Brancaccio Heart Valve Center at St. Francis Hospital and Heart Center in Roslyn, New York, their heart team assumed that like all hospitals, they had unidentified valvular heart disease patients in their system. But they had no evidence, and therefore no way to follow up with these patients.

"We have a very large structural heart program here at St. Francis and our hospital performs a lot of echocardiograms, either for our own physicians' patients or patients of referring doctors within our network. With the echoes our doctors order, we know there is follow-up if something was identified. But with the echoes ordered by other doctors, we don't know the outcome and if there is a treatment plan. Maybe the patients were treated by another heart valve specialist in the area, or perhaps they remain untreated."



Catholic Health
St. Francis Hospital
& Heart Center^{®*}

At a Glance

- Based in Roslyn, NY (Long Island)
- Service line leaders for Catholic Health
- New York State's only specialty-designated cardiac center
- First Heart Valve Center opened in 2015
- Second Heart Valve Center opened in 2017 at Good Samaritan Hospital, West Islip, NY
- In 2019:
 - More than 540 TAVR procedures performed at St. Francis Hospital
 - 70 TAVR procedures at Good Samaritan Hospital

Connecting the dots to identify the untreated

To help identify patients in need of care with valvular heart disease, St. Francis Hospital turned to the Mpirik Cardiac Intelligence platform.

Mpirik combines artificial intelligence algorithms and natural language processing to mine data, using precise patient screening parameters to identify potentially undertreated or untreated patients.

The HIPAA-compliant platform was customized for St. Francis to screen for specific valvular heart disease patients, based on echocardiograms and other data in the EHR.

"The reason Mpirik is so useful is that it can pick up discrete data points in the EHR and identify patients who have valvular heart disease but no current treatment plan. It can connect the dots for patients and physicians to receive better care," says Elizabeth Haag, RN, M.P.A., CCRP, Administrative Director of Research at St. Francis.



The Mpirik system continually sifted through the EHR for echocardiogram results, physician notes, surgery schedules, clinic visit appointments and lab results, searching for potential candidates for heart valve therapies.

—Elizabeth Haag, RN, M.P.A., CCRP

Mining for patients

On December 1, 2019, St. Francis Hospital began a 4-month assessment period with Medtronic and Mpirik to test the Cardiac Intelligence platform in the Heart Valve Center.

"The Mpirik system continually sifted through the EHR for echocardiogram results, physician notes, surgery schedules, clinic visit appointments and lab results, searching for potential candidates for heart valve therapies," Ms. Haag explained.

The St. Francis team logged in to the Mpirik system weekly to review the candidate list and reduce it to a narrow roster of potential patients for referral to the Heart Valve Center.

Supporting the St. Francis team

The Mpirik system was easy to use and integrate with the current St. Francis team's system.

The system uses a series of data filters that refine lists of patients from more general searches, like those patients who might be a potential referral.

But before a referral could be considered, the Heart Valve Center had to filter for additional criteria, including whether the patient had an active treatment plan, severity of valvular disease, comorbidities, and potentially disqualifying factors such as dementia or a terminal condition.

"The process of filtering in Mpirik was so easy," Ms. Pasquarello explained. "On the side menu of the system, there were boxes I clicked to refine patient results. It was just like shopping online, where you click filters to show only the products you want to see."



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—Kristin Pasquarello, M.P.A.S., PA-C



an automated email message from our EHR system asking for a referral of their patient, like Big Brother was watching," Ms. Pasquarello said.

"However, in hindsight, I think our concerns were unfounded. The referring physicians, for the most part, were receptive to our call and referred their patients to us. We made it very clear to them our goal was to help these patients — take care of them and send them back to their managing physician with a complete record of the care they received."

George A. Petrossian, M.D., Director of Interventional Cardiovascular Procedures at St. Francis Hospital, and Co-director of the John Brancaccio Heart Valve Center, agrees with more automation of the initial referral process.

"I think moving forward, we should automate the first contact with the referring physician," said Dr. Petrossian. "It would be an easier process to start with, and if we don't get a response, we could always follow up with the phone call."

Eventually, the Heart Valve Center would like to move to a simple electronic referral process. An email could provide background on the purpose of the message with a link to the patient's EHR record for the physician to review, and then a simple box for them to click that indicates, "Yes, please let the Heart Valve Center at St. Francis Hospital screen my patient."

A smooth referral process

Initial contacts with referring physicians were made by phone.

"When we began the program, we were concerned referring physicians might have a negative reaction to

Thumbs-up from patients

Once they received the physician's referral, the Heart Valve Center contacted the patient to schedule a visit for diagnostic testing and evaluation by the care team.

"Patients were very amenable to our call," said Ms. Pasquarello. "Many assumed the way they were feeling was just part of getting older. When we explained that their tests showed they had valvular heart disease and there could be ways to fix their valves without open heart surgery, they liked hearing that. For some of these patients — the ones with a lot of symptoms — I felt like we were a shining light at the end of the tunnel. Of course, they wanted to be seen in clinic the next day."



Suddenly, these patients had options they weren't aware of. Of course, they wanted to be seen in clinic the next day.

—Kristin Pasquarello, M.P.A.S., PA-C

4-month results

In the 4-month assessment period the Mpirik system helped the hospital achieve what it set out to do: Identify, screen, refer, and treat valvular disease patients who may otherwise not have received the interventions they urgently needed.

Getting St. Francis Patients from Evaluation to Treatment

4-MONTH ASSESSMENT FROM DECEMBER 2019–MARCH 2020

5,212

5,212 Echocardiograms in the St. Francis Hospital electronic health records (EHR) system were reviewed by Mpirik Cardiac Intelligence platform **over 4 months**.

72

72 patients met defined criteria and did not have an existing treatment plan.

- 31 with severe aortic stenosis
- 41 with severe mitral regurgitation

17

17 previously unidentified, untreated patients were referred to Heart Valve Center for interventions.

- 8 transcatheter aortic valve replacements (TAVR)
- 2 balloon valvuloplasty procedures
- 7 mitral valve interventions

Win, win, win

According to Newell Robinson, M.D., Chairman of the Department of Cardiothoracic and Vascular Surgery at St. Francis, and Co-director of the John Brancaccio Heart Valve Center, the Mpirik pilot program was a success for patients and the hospital.

"I saw triple benefits from the Mpirik pilot. One, we identified patients in our system who needed care but didn't have an active treatment plan. Two, we performed 17 procedures we would not have done otherwise. And three, the program appears to adequately pay for itself."



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A collaboration in care

The goal of the partnership between Medtronic and Mpirik is to help heart teams like the one at St. Francis Hospital find innovative ways to address undertreatment of heart valve disease.

The Mpirik Cardiac Intelligence platform harnesses artificial intelligence to identify the right patient at the right time for a needed therapy. For aortic stenosis patients, the window of opportunity to act can be short. The Mpirik platform can help heart teams find those patients and intervene.



The Medtronic partnership with Mpirik strengthens both companies' ability to collaborate across the care continuum to offer creative solutions to clinicians to easily expand their reach and identify more patients who need care.

Lessons learned

"The biggest piece of advice I would offer similar programs is to have a process owner to screen the information from the Mpirik system before sending it to your referring physicians," notes Ms. Pasquarello. "It could be one or two people, but make sure it's always the same people doing the manual review for quality and consistency."

Ms. Pasquarello says she could imagine potentially confusing scenarios for referring physicians if the Mpirik and EHR systems were sending messages without a human involved. "You really need a person screening everything before any messages are sent so you're not inconveniencing your referring doctors and creating more work for them."

Dr. Robinson advises other hospitals to take a look at the Mpirik Cardiac Intelligence platform.

"We were satisfied enough to consider using Mpirik on an ongoing regular basis to screen for potential patients for our Heart Valve Center," said Dr. Robinson. "We were looking for ways to tweak our program and we concluded that the Mpirik program could help us grow, at the same time it helped us provide better care for our patients."

Dr. Petrossian said the Mpirik system helped the St. Francis Heart Valve Center maximize the patient population they could reach and treat.



For me, it wasn't a lot of extra work to review the patient charts as a result of the Mpirik pilot. It was something I had to make time for, but in the end it was worth it.

—George A. Petrossian, M.D.

"But with anything that's worthwhile, you need to make a commitment to it and have an open mind to changing your workflow if needed. For me, it wasn't a lot of extra work to review the patient charts as a result of the Mpirik pilot. It was something I had to make time for, but in the end it was worth it."

"Mpirik is a wonderful resource," said Ms. Pasquarello. "You just need to be ready, because you will find patients in your system who may qualify for needed treatment. They are definitely out there and Mpirik can help you identify them."

Operational, clinical, and financial impact calculations were provided by St. Francis Hospital. Results may vary and depend on site implementation of recommendations.

¹Reflects total number of patients who could receive an aortic valve replacement.

References

¹ Medtronic data on file.

² Mpirik data on file.

³ Brennan JM. Under-treatment of Aortic Stenosis in the United States. Presented at TVT 2019; Chicago, IL.

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