

A Nurse Navigator Led Community-Based Cardio-Oncology Clinic





In the summer of 2016, Dr. Vijay Rao of Franciscan Physician Network Indiana Heart Physicians was alarmed when he realized that three patients he was treating for congestive heart failure had a history of treatment for breast cancer. Could any of the oncologic treatment regimens be responsible for these patients' cardiac conditions? Having worked at Genentech, the biotechnology company responsible for the development of the breakthrough breast cancer treatment trastuzumab, Dr. Rao recognized that the combination of anthracycline chemotherapy and trastuzumab was likely the culprit. Around the same time, the American Society of Echocardiography released a consensus statement recommending routine monitoring for chemotherapy-related cardiotoxicity with serial echocardiograms. Dr. Rao reached out to Dr. Eric Stephen Rubenstein, a medical oncologist at Franciscan Physician Network Oncology and Hematology Specialists, striking up a conversation about this topic that led to their joint attendance at the Global Cardio-Oncology Society meeting later that year. Dr. Rao and Dr. Rubenstein left that meeting with the realization that they could do much more to protect patients with cancer from potential cardiac toxicity of chemotherapy. The two returned to Franciscan Health Indianapolis with the goal of preventing the cancer survivor of today from becoming the heart failure patient of tomorrow.

In the Beginning

Over the next few months, in conversations with Franciscan Health Indianapolis leadership about developing and implementing a cardio-oncology program, key stakeholders from the hospital and its two affiliated practices identified the following strengths:

- An interdisciplinary program with two passionate physician champions—one in cardiology and one in oncology.
- Improved alignment of oncologists and cardiologists as part of Franciscan's multi-specialty physician network.

But how could hospital administration be convinced to hire a new navigator when there was no budget for the position? The answer was simple: Following oncologic guidelines for monitoring patients for cardiovascular toxicity via echocardiography increased the number of echocardiograms performed at the hospital.

- Administrators with experience in leading cardiology, imaging, and oncology service lines.
- Experienced nurse navigators in breast, colorectal, and lung tumor sites who could help shape a new nurse navigator role, if needed.
- A healthcare system transitioning from fee-for-service to value-based healthcare, identifying quality changes to make along the way to ensure success in the transition.
- A robust cancer survivorship program with emphasis on long-term wellness and outcomes.

Stakeholders identified several hurdles and/or barriers to a cardio-oncology program, including:

- The biggest challenge: no budget for developing and implementing a new program.

- Lack of general education among oncologists and nursing staff regarding cardio-oncology.
- The need to establish a direct line and workflow to cardiology for timely consults and imaging so oncology treatment would not be delayed.
- Concerns from oncology providers that chemotherapy would stop or be slowed due to cardiac evaluation.
- Patient scheduling challenges given that oncology and cardiology providers were not physically housed in the same building.

While examining these strengths and challenges, it became obvious to stakeholders that someone—an experienced clinician—was needed to act as a “bridge” to connect the two disciplines, oncology and cardiology, as well as establish screening algorithms to allow monitoring of patients through their treatment journey. From this revelation, the position for a cardio-oncology nurse navigator was born. But how could hospital administration be convinced to hire a new navigator when there was no budget for the position?

In the end the answer was simple: Following oncologic guidelines for monitoring patients for cardiovascular toxicity via echocardiography increased the number of echocardiograms performed at the hospital. Identifying this revenue stream was a great start for making a cardio-oncology nurse navigator business case. In addition, downstream revenue generated from new visits and additional testing, such as electrocardiograms, cardiac magnetic resonance imaging, and Holter monitors, added to the business case. Despite the potential for additional revenue, the new position was a leap of faith for the hospital because stakeholders did not know whether the volumes predicted would come to fruition because there were no other cardio-oncology programs to model ours after. In the end, the belief that a significant improvement could be made in patient care largely drove the decision to hire.

Here is where Kerry Skurka, RN, BSN, a registered oncology infusion nurse, enters the story. Professionally, Skurka was a practicing nurse and leader in cardiology, critical care, and emergency medicine for the last 40 years at several different Indiana hospitals. Her own personal battle with cancer occurred in 2008 when she was diagnosed with non-Hodgkin’s lymphoma. Despite her successful battle, she encountered cancer again in 2013, this time with her husband, who was diagnosed and treated for head and neck cancer and later passed away from non-Hodgkin’s lymphoma. This personal history drove her to a career change involving the bedside care of oncology patients, and in 2014 she joined Franciscan Physician Network Oncology and Hematology Specialists as an infusion nurse. While once again assessing patients at the bedside, Skurka quickly identified cardiac issues, such as hypertension and atrial fibrillation, and began calling clinician attention to these issues. Her experience in both cardiology and oncology made Skurka the perfect fit for the cardio-oncology nurse navigator position, where she hit the ground running.

Where Do We Start?

Early on, Dr. Rao and Skurka met often and set forth with two overarching goals: (1) to improve clinical outcomes and survivorship by minimizing cardiovascular effects of cancer treatment and (2) to shift the paradigm to early recognition and treatment of cardiotoxicities through cardiovascular risk stratification and prevention, thus creating a “proactive cardio-oncology” mindset.

In a practice with nearly 2,000 new patients with cancer per year, where does one start? The first step to meeting these goals was to assess the current oncology practice. Overall, the questions addressed fit into the following four categories.

Clinical

- What is the current cardio-oncology knowledge base among oncology and cardiology providers?
- What is the established practice in oncology as it relates to cardiac side effect care?
- What is the practice for cardiac surveillance, if any, and for what treatment regimens?
- Which subset of oncology patients will be seen by cardio-oncology first?
- What resources are available to aid the program in addressing cardio-toxic effects without delaying cancer treatment?

Administrative

- What infrastructure changes are needed to create a direct line to cardiology so that oncology patients are seen in a timely manner?
- Will Epic (the electronic health record) support an easy referral process and the scheduling of timely patient appointments, as well as prompt medical record documentation for the oncologist to assist with treatment management?
- How will continued follow-ups be facilitated and what will the process be to ensure patients return to their own cardiologist if a patient had one prior to cardio-oncology care?
- What guidelines and resources are available to lay the foundation of a cardio-oncology plan?

Actionable

- How will providers and staff get the training they need to identify signs and symptoms?
- In what format will follow-up information be shared with medical oncologists and their staff?
- Who will address the operational issues within the cardiology and oncology practices?

Outcomes

- Is a regularly scheduled meeting necessary to oversee program development and present updated data with key stakeholders in attendance? Will process improvement be addressed at the same time?
- How will clinical outcomes be shared with the medical oncologists and their staff?

To begin to answer these questions, it became apparent that foundational education was necessary, including clinical guidelines and research studies. Dr. Rao shared this information with key stakeholders in oncology and cardiology by presenting at Franciscan's bi-annual oncology symposium, speaking at oncology Grand Rounds, and creating internal case-based conferences.

Next, the team settled on 2D echocardiography with intravenous contrast to screen for left ventricular dysfunction in patients receiving anthracyclines and/or trastuzumab. Echocardiography was selected because it was readily available and easy to perform, lacked radiation exposure, and provided information about valves and pericardial effusions, which were not assessed with historical multi-gated acquisition scans. Decrements in global longitudinal strains on echocardiography were shown to predict future drops in heart function, leading Dr. Rao to educate Franciscan echocardiography technicians on how to perform measurement and his cardiology colleagues on how to interpret the studies.

New Processes and Workflows

The next step included developing processes and workflows within the Franciscan Health Indianapolis system that would ensure quality care of the cardio-oncology patient (see Figure 1, page 54). The workflow included the following steps.

Through chart mining, Skurka identifies oncology patients with a treatment plan that includes a cardio-toxic drug. Initially, Skurka focused on patients who were prescribed trastuzumab and anthracyclines because these two agents are known to have high rates of cardiotoxicity, particularly if combined in treatment regimens.

Next, these patients undergo an echocardiogram to measure their baseline heart function (ejection fraction). Skurka monitors patient charts to ensure that the echocardiogram is completed. Additionally, she reviews their history, calculates a cardiac risk score, and determines whether a cardio-oncology consult is warranted.

At this point in the process, it is extremely important and beneficial to have a direct line to cardiology, because the cardiology practice schedules patients several weeks out. At the start of the cardio-oncology program, there were not enough appointment times on Dr. Rao's schedule alone to accommodate oncology patients. The need for additional cardiologists with cardio-oncology expertise became apparent, so Dr. Rao approached Drs. Atul Chugh and Ryan Daly, two of his partners with extensive experience in cardiovascular imaging, to join the cardio-oncology team. With efforts coordinated by Dr. Rao, both cardiologists became more comfortable seeing cardio-oncology patients within a year. The addition of two more cardio-oncologists and Skurka acting as the direct line between the two practices means that oncology patients are now seen by cardio-oncologists within days instead of weeks, ensuring minimal delays in oncology treatment.

The cardio-oncologists work closely with Skurka and their colleagues in oncology to ensure that each patient moves forward with oncology treatment, including prescription of cardio-

Today pharmacists and nurse navigators play an integral role in the cardio-oncology clinic, from educating patients about drug-drug interactions to helping patients with the emotional stress associated with hearing about cardiovascular complications while receiving chemotherapy.

protective medications and initiating a cardiac surveillance plan. The cardio-oncology nurse navigator follows the patient, tracking surveillance testing and health status while addressing any issues from testing or symptoms in a timely manner.

The last step in the process was to find any pre-existing tools to identify patients with cardiac risk. Mayo Clinic's Cardio-Risk Assessment Tool (Figure 2, page 56) became the team's assessment tool of choice.

The Cardio-Oncology Nurse Navigator Role

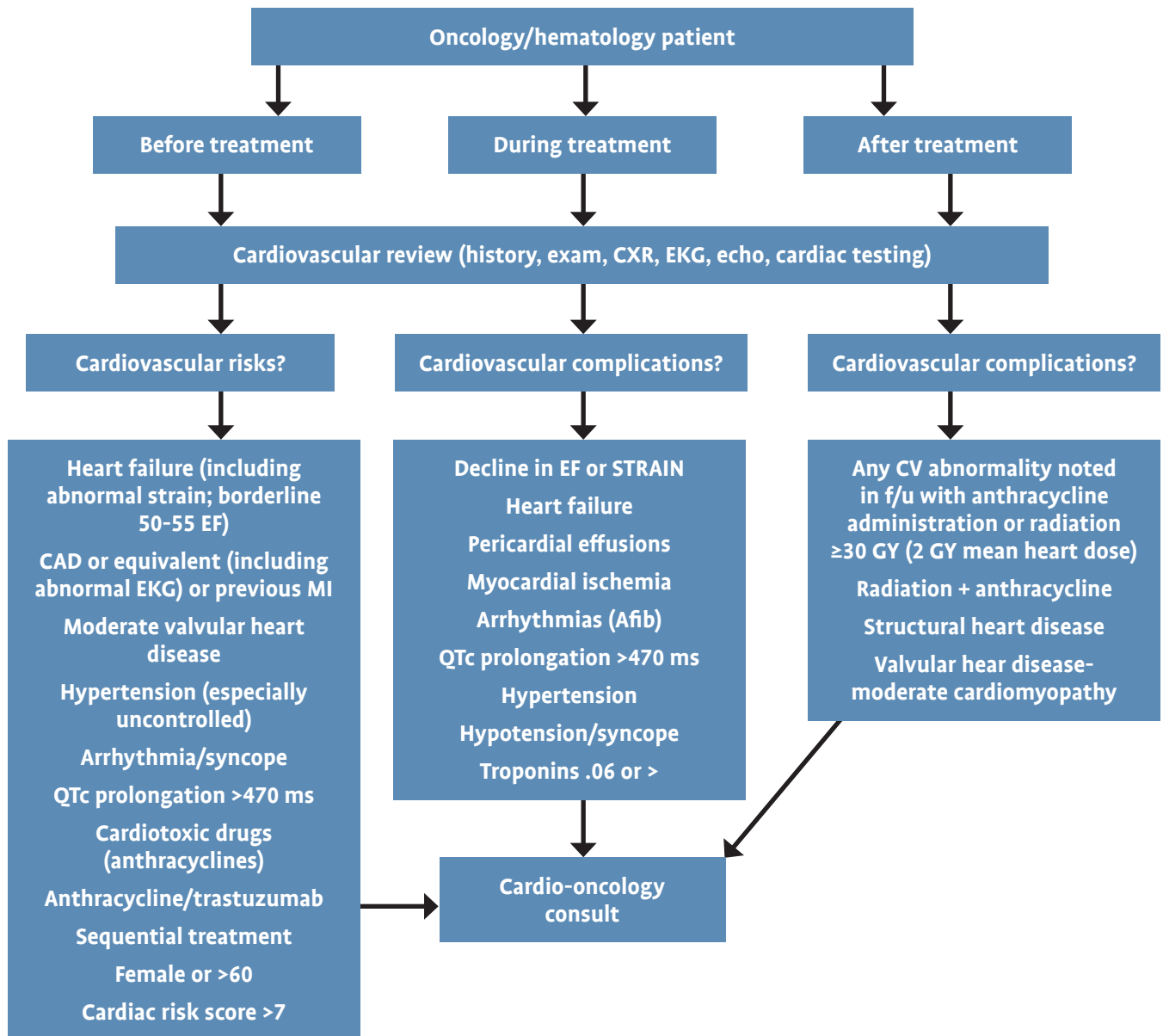
Once the team set goals and identified the steps needed to make the program impactful for patients, they had to decipher which workflows would work for navigation. Outside of mining patient charts, how was Skurka going to identify patients? What processes were already in place to ensure timely surveillance? What was the oncologist responsible for and what was the cardio-oncologist responsible for? The team identified the current workflows and assessed the gaps, some of which included:

- Inconsistent and ill-defined workflow processes.
- Lack of ownership over the completion of tests, as well as follow-up for abnormal results.
- Knowledge gaps surrounding several topics. In oncology this meant understanding and following new recommended guidelines related to evidence-based cardiovascular surveillance testing and interventions. It meant understanding old versus new standards of cardiac diagnostic testing. For example, Definity, an image enhancer used in echocardiography, has a very short half-life and is not a contrast agent therefore does not affect kidney function. Other gaps in knowledge were around use of biomarkers, such as troponin; comfort levels with abnormal results; and drawing and timing of draws for oncology staff. For cardiology, clinicians had to have knowledge of oncology medical regimens, timelines of patient flow for all care providers, and chemotherapy.

Like Dr. Rao, Skurka's job quickly morphed into one of education. To do so, she spent countless hours in Franciscan Physician

(continued on page 55)

Figure 1. Franciscan Health Cardio-oncology Workflow



*ASCO, NCCN, Mayo Proceeding 2014 CRS-Cardiac risk assessment. Source: Adapted from Herrmann et al.² AFIB = atrial fibrillation; CAD = coronary artery disease; CV = cardiovascular; CXR = chest x-ray; EF = ejection fraction; EKG = electrocardiogram; Echo = echocardiogram; F/U = follow up; GY = gray; MI = myocardial infarction; MS = milliseconds; QTc = QT corrected.



Top Row, Left to Right: Angela Brittsan, MD, PhD; Casey Browning, NP-C; Atul Chugh, MD, FACC, RPVI; Ryan Daly, MD, FACC, FASE, FSCMR, FSCCT
Bottom Row, Left to Right: Holly Page, RN, BSN, CCRN; Meghana Raghavendra, MD; Vijay Rao, MD, PhD, FACC, FASE, FHFSA; Kerry Skurka, RN, BSN

(continued from page 53)

Network Oncology and Hematology Specialists' infusion suite, training the nursing staff on the signs and symptoms related to cardiac disease. Her focus was continuous rounding that included checking in, listening to concerns, and sharing patient follow-up information with the nursing staff and medical oncologists. This format allowed Skurka to share up-to-date patient information daily.

Skurka spoke often with medical oncologists about patients who were under the cardio-oncologists' care to foster collaboration and to strengthen interdisciplinary relationships. Today Skurka admits that this was one of her biggest personal and professional challenges because she had to convince each set of physicians—cardiology and oncology—that she could be the eyes and ears who understood both sides of patient care. To successfully fulfill this role, both the cardio-oncologist and the medical oncologist had to see and accept the cardio-oncology nurse navigator as an extension of them. Confident with her strong clinical and foundational knowledge in both disciplines, Skurka was able to support the respective patient management strategies in her assessments and decision-making skills.

Education and training are ongoing. For example, during routine follow-up on discharge rounds, Dr. Rao found that cor-

onary vasospasms were being incorrectly charted as unknown etiology. This revelation led to a patient care initiative, including education in the emergency department, critical care unit, cardiac catheterization lab, and oncology units. Education included the fact that coronary vasospasm can occur with 5-F-based chemotherapy and emphasized the critical need to shut off the infusion pump when patients present with chest pain.

Growing the Program

Bolstered by success stories supporting its positive impact, the cardio-oncology program quickly grew. A part-time medical assistant (MA) was added in 2017; this position took over the scheduling portion of patient care, so the cardio-nurse navigator could focus on identifying more patients who would benefit from a cardio-oncology consultation. The MA became a second direct line from oncology to cardiology with access to scheduling echocardiograms and appointments with the cardio-oncologists. That same year, time was blocked out on the cardio-oncologists' schedule, allowing for two to three dedicated appointments per week that the MA could use for oncology patients.

In 2018, a second nurse navigator, Holly Page, RN, was hired to follow patients who were receiving oral chemotherapy only.

Figure 2. Mayo Clinic Cardio-Oncology Risk Assessment Tool

Medication-related risk	Score	Patient-related risk factors (1 point per risk)	Score	Recommended Surveillance Testing
High (risk score of 4)		CAD or equivalent (include PAD)		Baseline 2D transthoracic echocardiogram with strain/definity and troponin/brain natriuretic peptide for all who require monitoring
Anthracyclines, cyclophosphamide (>150 mg/kg, >1.5 g2/daily), ifosfamide, clofarabine, trastuzumab		Hypertension		
		Diabetes mellitus		Anthracyclines: baseline; at cumulative dose of 240-300 mg/m2; at cumulative dose of 400-450 mg/m2; then prior to each additional 50 mg/m2; completion, then again at 6 months to 1 year
Intermediate (risk score of 2)		Prior or current use of anthracycline		
Docetaxel, pertuzumab, sunitinib, sorafenib		Prior or current chest radiation		Trastuzumab/pertuzumab: baseline; Q3 months, completion and then every 6 months for 2 years (neoadjuvant with both drugs echo surveillance is recommended at 6 weeks)
Low (risk score of 1)		Smoking		
bevacizumab, dasatinib, imatinib, lapatinib		Atrial fibrillation		
		Hyperlipidemia		
Rare (risk score of 0)		BMI >30		
Etoposide, rituximab, thalidomide		OSA		
		Female; Age <15 or >60		
Medication Score		Patient Risk Score		

Medication + patient risk = total cardiac risk score

Cardiac monitoring: Baseline echo/troponin/ Cardiac risk score

Cardiac Risk Score (CRS)

>8: Very high

7-8: High

5-6: Intermediate

Note: The patient-related risk factors (bold, second column) were added based on new cardio oncology guideline recommendations. BMI = body mass index; CAD = coronary artery disease; OSA = obstructive sleep apnea; PAD = peripheral artery disease; TTE= transthoracic ecocardiogram

During planning for this full-time position expansion, much discussion took place as to what type of experience was required for the new position. The team decided it was best that the new nurse navigator have cardiology experience because oncology could be more easily learned, especially with the help of the many oncology nursing experts. The MA position went from part time to full time to keep up with the additional oral chemotherapy patients managed by the second nurse navigator. Given the programmatic growth, the need for a dedicated cardio-oncology clinic became evident by June 2018. This clinic was scheduled to occur as a half day every other week. Today pharmacists and nurse navigators play an integral role in the cardio-oncology clinic, from educating patients about drug-drug interactions to helping patients with the emotional stress associated with hearing about cardiovascular complications while receiving chemotherapy. Patient satisfaction surveys are regularly conducted for all patients seen in this clinic and have routinely included positive feedback, such as:

“The entire staff is well-trained, compassionate, and put me at ease!”

“The team makes you feel important and well-informed.”


“I had a great time at my appointment, so thankful the radiation oncologist recommended I come here.”

Along the way, the team developed and implemented nurse navigator-led quarterly cardio-oncology board meetings, which included key stakeholders in clinical leadership and administration. At these board meetings, key metrics are reviewed and issues in clinical care are discussed and addressed by the group who can make the necessary changes. These meetings allow clinical leadership and administration to see the cardio-oncology program’s impact in real time and have been an asset to further program development. Figure 3, right, is a template agenda for these quarterly cardio-oncology board meetings.

A strong component of Franciscan Health Indianapolis’s cancer program is the multidisciplinary tumor boards offered for breast, lung, colorectal, gynecologic oncology, and melanoma. These tumor boards are well attended by not just medical and radiation oncology but also research, pathology, surgery, and radiology.

(continued on page 58)

Figure 3. Cardio-Oncology Quarterly Board Meeting: Sample Agenda

Mission: Insert organizational mission  Franciscan HEALTH		Insert Meeting Date	
		Insert Meeting Time	
		Meeting Format: In-Person, Virtual, Combo, etc.	
Purpose:	Cardio-Oncology Program Meeting		
Meeting called by:	Cardio-Oncology Nurse Navigator	Notetaker:	
Facilitator:	Cardio-Oncology Nurse Navigator	Timekeeper:	
Invitees/Team Members:	Insert team members: Could include key physicians, nurse navigator, and leadership from oncology, cardiology, and hospital, if applicable		
Ground Rules:	Insert ground rules per your organization		
AGENDA ITEMS			
Pillar	Agenda Item and Discussion		
	Call to Order and Prayer		
	Introductions and Announcements: <ul style="list-style-type: none"> • 2021 meeting dates • Announcements 		
	Statistics: <ul style="list-style-type: none"> • Surveillance monitor numbers • Oral numbers update • Referral numbers 		
	Cardio-Oncology Clinic: <ul style="list-style-type: none"> • Clinic update • External referrals review • Virtual visits update 		
	Billing and Coding: <ul style="list-style-type: none"> • Strain 		
	Patient Care and Quality Assurance:		
	Program Updates: <ul style="list-style-type: none"> • IT/IS data and CRS update • Nurse navigation EPIC tool • CORE update • Indiana ACC – Cardio-Oncology Subsection Update 		
	Education: <ul style="list-style-type: none"> • ICON (Indianapolis Cardio-Oncology Network) presentation • ICOS Nurse Network Collaborative • Ask a Doc at Cancer Support Community • Nursing grand rounds 		
	Research: <ul style="list-style-type: none"> • SURVIVE registry • Coreg Trial • CRS Our Data/Retrospective Validation 		
	Open Discussion: New Business <ul style="list-style-type: none"> • Expansion plans 		

(continued from page 56)

When the cardio-oncology program first started, Skurka attended these tumor boards to get face-to-face time with the physicians, to learn the styles and methodologies of the medical oncologists, and to share more information about cardio-oncology. Eventually cardio-oncology tumor boards were added to Franciscan Health Indianapolis Cancer Center's robust lineup, fostering important dialogue that showed the value of cardiology participation in oncology care. Dr. Rao also wanted to improve awareness of and access to this specialized knowledge and reached out to fellow cardio-oncology program directors in Indianapolis and started the Indianapolis Cardio-Oncology Network. Indianapolis Cardio-Oncology Network is a quarterly multidisciplinary case conference that involves fellows, pharmacists, nurses, cardiologists, oncologists, and bone marrow transplant clinicians. Cases are videotaped with a plan to distribute to a larger audience via social platforms.


The team at Franciscan Health Indianapolis has a track record of quality patient care, coupled with innovation in healthcare. Given the success with its cardio-oncology program in Indianapolis, Franciscan Alliance, is looking to develop similar programs across the 12-hospital system. Skurka and Dr. Rao are currently working with the team at Franciscan Health Lafayette in Lafayette, Ind., to develop their program and have recently given Grand Rounds to engage with the oncology and cardiology teams there. Not only has the cardio-oncology team educated hospitals within Franciscan Alliance, but Dr. Rao and Skurka have also shared best practices with Franciscan-affiliated community hospitals across south-central Indiana.

Today, the cardio-oncology team includes four cardio-oncologists: Vijay Rao, MD, PhD, FACC, FASE, FHFSA (program medical director); Atul Chugh, MD, FACC, RPVI; Angela Brittsan, MD, PhD; and Ryan Daly, MD, FACC, FASE, FSCMR, FSCCT; one cardio-oncology nurse practitioner, Casey Browning, NP-C; one medical oncologist lead, Meghana Raghavendra, MD; two full-time cardio-oncology nurse navigators, Kerry Skurka, RN, BSN, and Holly Page, RN; and one full-time medical assistant, Amelia McElyea, CMA, CPA. In addition to these team members, the following specialties are also involved in the care of cardio-oncology patients:

- Radiology
- Pharmacy
- Cardiovascular testing
- Lab services
- Infusion center nurses and staff at Franciscan Physician Network Oncology and Hematology Specialists
- Intake staff at Franciscan Physician Network Oncology and Hematology Specialists and Franciscan Physician Network Indiana Heart Physicians
- Oncology social workers
- Oncology and cardiology leadership via the cardio-oncology board
- Oncology and cardiology research
- Oncology Supportive Care Clinic
- Information technology department.

Future Plans

As many have experienced, 2020 disrupted healthcare in a way that none of us predicted. One bright spot in that disruption was the installation of telemedicine at Franciscan Health Indianapolis. Telemedicine allowed oncology patients to see cardio-oncologists throughout the early days of the pandemic while minimizing their risks given their often immuno-compromised status. Approximately 50 percent of cardio-oncology visits were virtual in third quarter 2020, as total overall visits increased 40 percent from 12 to 20 patients per week. This technology change is something that Dr. Rao explores in his 2020 co-authored manuscript in *Frontiers in Cardiovascular Medicine*, which focuses on precision medicine and the digital transformation of cardio-oncology in the post-pandemic world.¹ Additional opportunities being explored include virtual cardio-oncology exercise rehabilitation and real-time, three-way consultations between the patient, oncologist, and cardiologist at the time of initial consultation. Though the cardio-oncology program has experienced intense growth over the last four years, we have not yet been able to expand into our radiation oncology or bone marrow transplant departments. Future plans include hiring a third full-time nurse navigator to address these populations.

Thanks to efforts of clinician champions, a supportive administration, and the tireless work of our cardio-oncology nurse navigators, cardio-oncology patient care has seen a swift transformation at Franciscan Health Indianapolis over the last four years. Day in and day out, our care providers advocate for the best cardiac and oncologic care for their patients—changing more than 1,000 patient lives and counting. As our program grows, we hope to set an example of a gold standard for care for community-based programs across the nation while ensuring that today's cancer survivor does not become the heart failure patient of tomorrow. 

Rachael Zirkelbach, BA, is a business development manager at Franciscan Health Indianapolis; Kerry Skurka, RN, BSN, is a cardio-oncology nurse navigator at Franciscan Health Indianapolis Cancer Center; and Vijay U. Rao, MD, PhD, FACC, FASE, FHFSA, is a cardiologist at Franciscan Physician Network Indiana Heart Physicians and medical director, Cardio-Oncology Program at Franciscan Health Indianapolis, Indianapolis, Ind.

Reference

1. Brown SA, Rhee JW, Guha A, Rao VU. Innovation in precision cardio-oncology during the coronavirus pandemic and into a post-pandemic world. *Front Cardiovasc Med*. 2020;7:145.
2. Herrmann J, Lerman A, Sandhu NP, Villarraga HR, Mulvagh SL, Kohli M. Evaluation and management of patients with heart disease and cancer: cardio-oncology. *Mayo Clin Proc*. 2014;89(9):1287-1306.
3. Teske AJ, Linschoten M, Kamphuis JAM, et al. Cardio-oncology: an overview on outpatient management and future developments. *Neth Heart J*. 2018;26(11):521-532.