Designed for

In this age of consumer-driven healthcare, community cancer centers must be innovative in their program development and offer personalized services to savvy consumers in a competitive market. Virtua Health has successfully used the Design for Six Sigma (DFSS) methodology—a data-driven quality strategy for re-designing existing or designing new products, services, and processes not typically employed in the healthcare setting—to design a navigation program that aligns specific customer requirements and enhances the patient, caregiver, and physician experiences. Using the DFSS approach, our project team prioritized our customer needs, translated them into precise specifications, and integrated them into the design of the Breast Navigation Program. The methodical DFSS approach requires commitment from the design team. This commitment—coupled with up-front investment in time and resources—yields successful designs that eliminate or greatly reduce the need for costly redesign after implementation.

Virtua's use of DFSS in the development of its Breast Navigation Program demonstrates the applicability of DFSS to the healthcare setting and the critical impact such a rigorous, structured approach can have on program development and, ultimately, patient care.

V irtua Health is a non-profit multi-hospital healthcare system located in southern New Jersey serving a diverse population of more than 1.2 million individuals living within the service area. Virtua employs 7,100 clinical and administrative personnel and has approximately 1,800 physicians as medical staff members. Like hospitals and health systems across the country, Virtua manages many services through categories of care known as Programs of Excellence (POE). POE objectives are to improve quality and access to care, to lower cost, and to promote program growth. Each POE is measured against national care standards to identify opportunities for improvement in clinical quality and service excellence. Virtua's Oncology POE and its associated Breast Cancer Care Program are critical service line components.

Why Patient Navigation?

Based on Dr. Harold P. Freeman's pioneering research, the patient navigation model was originally developed to reduce disparities in breast cancer care treatment and mortality rates for minority women. Ongoing research has demonstrated that the navigation model can support *all* cancer patients and their families by providing seamless, coordinated, and timely care.[1]

Virtua Health Administration proposed the development of a patient navigation model to differentiate its oncology service line from it competitors through personalized service delivery. In 2005, Virtua partnered with GE Healthcare (GE) Performance Solutions to conduct an environmental assessment of its Breast Cancer Care Program. Through this assessment, the following opportunities for improvement were identified:[2]

- Facilitating coordination of care on behalf of the patient from abnormal mammogram through treatment and surveillance
- Reducing cycle-time from abnormal finding to specialist consult
- Decreasing out-migration to competitors
- Increasing referrals to Virtua oncology services
- Improving access to patient care services.

POE leadership believed that a patient navigation program would offer breast cancer patients a superior customer experience and address each of the opportunities identified in the GE Performance Solutions study. The navigation program would provide timely, coordinated, and integrated multi-specialty quality care.

Rather than assume we knew what was best for our patients and physicians with regards to a breast navigation program, we brought together a multidisciplinary team of providers and administrators to develop and implement a Breast Navigation Program for patients with abnormal findings and those diagnosed with breast cancer. The first step in designing a new service—identifying what you are designing and why you are designing it—was completed. The next, equally critical step was to understand customer requirements for the service and to ensure that the design meets these requirements.

Research, Research, Research

During initial program development, Virtua staff conducted a literature search and interviewed providers at other healthcare organizations to identify best practices in developing a patient navigation program. This research revealed examples of navigation programs, their supporting structures, and their intended goals; however, little to no information was available on their development processes. Further research revealed that healthcare organizations with patient navigation programs often developed their programs using unstructured approaches with limited input from customers and key stakeholders. In addition, none of the healthcare institutions identified in the literature search were capturing and monitoring in-process and outcome measures.

Success

Developing and implementing a
pilot breast navigation program
using the Six Sigma methodology

by Lisa Shalkowski, BSN; Kevin O'Leary, MHSA; and Lisa Demko, MS, CCC-SLP

Table 1. Design for Six Sigma: Five Phases

Define	Measure	Analyze	Design	Verify
1. Initiate the project	4. Identify customers	7. Develop design concepts	10. Develop detailed design	13. Execute pilot and analyze results
2. Scope the project	5. Gather customer needs	8. Develop high-level designs	11. Evaluate and optimize detailed design	14. Full scale implementation
3. Develop project charter	6. Specify CTQs	9. Evaluate high-level designs	12. Prepare control and verification plans	15. Transition to process owners

Our conclusion: Virtua needed an approach that identified key stakeholders, captured their needs and wants, and integrated these requirements into a robust program design. Virtua identified the optimal tool to accomplish its goals—the Design for Six Sigma (DFSS) methodology.[3] This approach would require more work upfront, but would reduce the likelihood of redesign in the future, therefore increasing the chances of the program successfully meeting its objectives.

DFSS is based on a simple premise: know and understand your customers, identify their critical to quality (CTQ) requirements, and design a program or service to meet these requirements. The DFSS approach consists of five interconnected phases 1) define, 2) measure, 3) analyze, 4) design, and 5) verify (see Table 1).[4]

Typically, this approach has been used successfully in non-healthcare environments; however, applying this methodology to the development of a new healthcare program was a novel, yet appropriate, approach. Virtua's goal was to create a patient navigation program that would be successful, sustainable, and could be easily duplicated.[5-7]

Here is how our Breast Navigation Program developed through the five phases.

Define Phase
In April 2006, Virtua Health established a Breast Navigation DFSS Team to spearhead the Breast Navigation Project, which would target patients from abnormal mammogram through treatment and surveillance. During the Define Phase, the team scoped the project in two distinct phases or generations (i.e., Generation I and Generation II). Generation I would be a pilot roll out of the breast navigation program, and Generation II would be an expanded breast navigation program. In addition, during the Define Phase, the team developed a business case that addressed the opportunities for improvement identified by the GE study, inferred the high-level customer needs, and defined the roles of team members and the project timeline (See Table 2).

Measure Phase
This phase focused on identifying key customers, understanding their needs, and translating those needs into specific design requirements (i.e., critical to quality, or CTQs). The team identified our target customers as the patient and the patient's caregivers and physicians. Customers were segmented by geographic location, physician specialties, position within the practice (e.g., RN, office manager, physician), and physician referral patterns to Virtua. Next, the team gathered information on customer needs by selecting the appropriate customer research method, developing the data collection tool, and obtaining the data.

Team members used information from the literature review to educate themselves about patient navigation and to understand what they needed to learn from their customers.[8] This research provided a high-level overview of a nurse navigator's role, the impact of nurse navigation on coordination of patient care and clinical outcomes, and possible models for navigation.

Based on this information, the team created a standardized question guide, which they used when interviewing other organizations that had started patient navigation services (see Table 3). Included were questions about services provided, supporting processes, resource requirements, and lessons learned. These interviews were conducted mainly via conference calls. In addition, team members made two site visits to hospitals with mature navigation programs.

The team also assessed organizations in other industries to identify best practice information on navigation of cus-

Table 2: Project Charter

Background Information
- Dissatisfied customers
- Delays in care
- Numerous patient touch points
- Fragmented care
- Access challenges to Virtua's healthcare system
- Losing patients to competitors
- Predicting an increase incidence for cancer (one out of every two men; one out of every three women will receive a cancer diagnosis)
- On average, oncology patients will need to schedule 100 visits the first year after diagnosis.

Opportunity
To create a system of better coordinated care in order to make access to Virtua services easier for customers and to enhance quality care.

Project Service Description
Design and implement personal navigation services for our oncology patients and their physicians to better coordinate care and improve access to Virtua services. This effort will include integrating and optimizing related patient care systems.

Project Scope Generation I
- Access navigation from abnormal mammogram to surgical consult for one OB/GYN physician practice
- Nurse navigation for diagnosed breast cancer patients
- Limited to two physician practices.

Project Scope Generation II
Expand nurse navigation and access navigation to all breast care physician practices and OB/GYN practices.

Business Case
- To support patient satisfaction initiatives
- To support physician satisfaction initiatives
- To advance POE development
- To optimize use of services
- To transform patient experience
- To enhance Virtua brand
- To differentiate Virtua in the marketplace
- To reduce out-migration of patients to competitors.

High-Level Consumer Needs
- Streamlined care
- Simplicity
- Communication between specialists and primary care physicians
- Education
- Resource identification needs
- Service quality and excellence.

Timeline

Define	04/28/06
Measure	08/07/06
Analyze	10/16/06
Design	12/16/07
Verify	03/08/07

Leadership Roles
- Sponsor: VP/COO Ambulatory Services POE
- Process Owner: director of Breast Care Program
- Team Members: breast coordinator, Information Services (IS), and practice administrator
- Black Belt and Green Belt.

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tomers, including Disney, Cruise Lines, AAA Travel, and Ritz Carlton. These findings, along with patient satisfaction survey results and a community needs assessment conducted through Virtua's marketing department, were compiled to frame customer needs. The team then analyzed the information and determined any need for additional customer input.

Next, the team conducted interviews and focus groups with caregivers and cancer survivors who were treated at Virtua and other healthcare systems. From these two groups, the team learned that:
- Easy and timely access to surgical consultations post abnormal findings is essential to their emotional well-being and a successful outcome.
- Coordination of care and information flow between providers and various clinical areas should convey a sense of competence and safety. Patients want to be assured that "*Everyone knows what is going on with me.*"
- Care coordinators are a significant delighter to patients.
- Supportive care services should be easy to access (mostly for caregivers).
- Diagnostics should be conveniently located in a one-stop setting and appointments clustered on the same day.
- Female patients and caregivers have significantly greater need for information than males. Females will seek infor-

mation from numerous sources, including the physician, clinical staff, support groups, and the Internet.

The team then surveyed physicians, specifically targeting primary care physicians (and their office managers) and specialists. The survey included a demographic section, a numerical question section, and an open response question section. The survey gauged:
- Respondents' current level of satisfaction,
- Perceived need for a navigation service, and
- Important elements of a navigation service from their perspective.

Certain hypotheses generated by other customers' input were also tested, validated, and quantified via the physician survey. For example, patients and caregivers ranked coordination of services and information sharing between disciplines as a high priority. This premise was presented in the physician survey, and provider responses indicated this issue was important to primary care physicians as well. Significant outcomes of the physician survey included:
- Primary care physicians rated their satisfaction with Virtua services lower than their specialist peers. Specific concerns included dissatisfaction with receiving test

Both physician groups [primary care and specialists] identified "coordination of care" as having the most opportunity for improvement.

Table 3. DFSS Site Visit Question Guide

Process and Services Provided

1. What prompted you to develop this program? What VOC did you obtain? How? Who?
2. Describe the evolution of your program.
3. What is the scope of services? Are there common touch points during a care path between the navigators and patients? Is a patient transportation service integrated with the patient navigator program? How does the navigator service integrate with the pre-registration process? Describe how insurance referrals are obtained.
4. Please share your high-level process steps.
5. How are patients identified and connected to the service?
6. Does your call center support the program through its scheduling function?
7. How do patient navigators and scheduling interface?
8. What scheduling software do you use?
9. Does the patient navigator facilitate referrals to services outside the Medical Center? How?
10. How is information sent from the navigator to the patient? Is it standardized or personalized?
11. What are the backgrounds of the patient navigators (clinical/non-clinical)?
12. Do you have job descriptions of the patient navigators that you can share?
13. What is the reporting structure for the patient navigators?
14. What is the staffing complement of the patient navigators? How did you initially arrive at that number/composition?
15. Please describe how the Medical Center addresses relevant HIPAA regulations.

Interactions

1. Describe how the patient navigators interact with physician offices.
2. Describe how the patient navigators interact with a patient's family, caregivers.
3. To what extent, if any, is there collaboration with third party payers?
4. What is the level of buy-in for the program from the physician community (private and owned practices if applicable)?
5. How were you able to move appointment timelines from weeks to days?

Resources/Utilization of Service

1. What start-up resources (e.g., time, dollars) were required?
2. What are your funding sources for the program?
3. What is the utilization of the service? (Current, growth trend)
4. What functions of the program are assessed to measure success? What metrics are used to measure performance?
5. Are there productivity measures for the navigators? What is optimal productivity?
6. To what extent is the patient navigator service marketed to its key customer group(s), to the community in general? What vehicles are used?

Lessons Learned

1. What were the greatest challenges to successfully implementing the program?
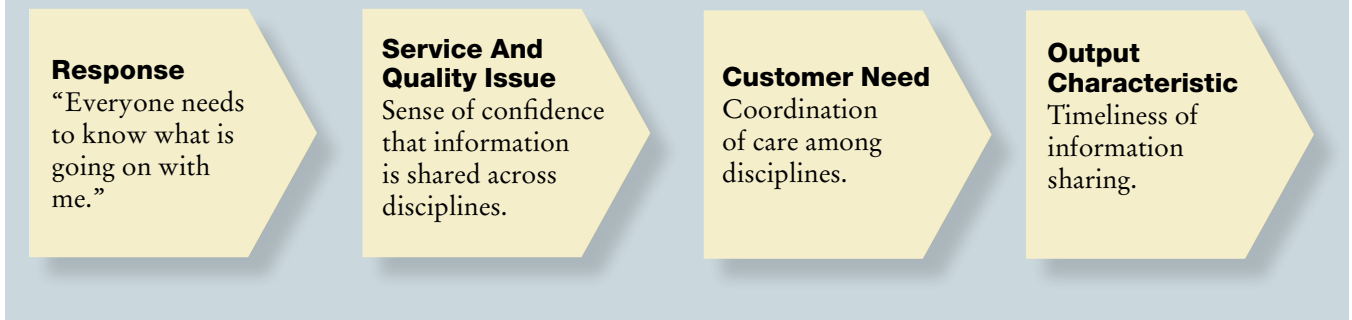2. What would you do differently with benefit of hindsight?

results and obtaining a specialist appointment.

- Both physician groups rated their satisfaction with the availability and timeliness of appointments with breast surgeons within Virtua as low.
- Both physician groups identified "coordination of care" as having the most opportunity for improvement.
- Both physician groups rated scheduling, patient education, access to support networks and resources, and communicating with patients and families equally.
- Specialists who function as the primary provider of the patient's treatment phases scored the importance of the proposed navigation service higher than primary care physicians.

- Primary care physicians rated the overall value of a navigator service lower than specialists.
- Satisfaction scores appeared related to the respondent's proximity to the process (e.g., office managers scored their satisfaction with obtaining diagnostic appointments lower than the physicians).
- Primary care office managers may view the service (i.e., patient navigation program) as an incursion upon their responsibilities.

The next step in the Measure Phase: translate customer needs into measurable CTQs (critical to quality) and prioritize those to be built into the navigation design. Using

Figure 1. Sample Customer Needs Mapping

Response
"Everyone needs to know what is going on with me."

Service And Quality Issue
Sense of confidence that information is shared across disciplines.

Customer Need
Coordination of care among disciplines.

Output Characteristic
Timeliness of information sharing.

a tool called Customer Needs Mapping, responses from all customers (patients, caregivers, and providers) were organized in order to:

1. Identify the customer service and/or quality issue
2. Transform the quality issue into the customer need
3. Translate the customer need into the output characteristic of that need (See Figure 1 above).

When establishing CTQ elements, metrics are defined and specification limits are set for each metric. Most importantly, the CTQ elements are validated with the customer. Deciding which of the CTQs are the most important requires prioritization of customer CTQs. To accomplish this, our team used a tool called Quality Function Deployment (QFD).[9]

A QFD is a structured methodology and mathematical tool used to identify and quantify customers' requirements and translate these into critical parameters. In DFSS, the tool compares the high level "what's" (i.e., customer CTQs) to the "how's" (i.e., product requirements) to meet these "what's" (i.e., customer CTQs). The final result is a Pareto chart listing key components in order of importance to the customer (See Figure 2, page 29). This list of prioritized program components provides direction to the project team on which components need further development (e.g., What does "one point of contact" mean? Who performs this role?). Once these program components were identified, our team quickly recognized that a technology platform would be needed to support the design. The team commissioned the development of a web-based database for the patient navigation program, where patient information is entered and accessed throughout the navigation episode. This database serves multiple functions, including contact management, patient tracking, and reporting. (Database functionality is further described under the "Pilot Program" section of this article.)

The last step in the Measure Phase: develop a scorecard that sets process performance targets and specifications. The scorecard offered a systematic approach to organizing CTQs, provided an accounting and reporting tool for the design team, and helped predict service performance capability and the impact of design decisions on performance. The scorecard also determined the CTQ specifications for measures, performance targets, and limits.

This phase of the DFSS process was crucial to the project's success because quantifying the CTQs helped the team in understanding which design requirements had to be met during the Analyze and Design Phases.

Analyze Phase

In the third DFSS phase, our team analyzed the proposed plans. Using its Analyze Flow Chart, the team began designing the Breast Navigation Program, identifying the specifications necessary for its implementation (see Figure 3, page 29). Starting with the overall service and process CTQs developed during the Measure Phase, the team identified the key functions needed to deliver the service. These included:

- Identifying the patient with an abnormal finding
- Offering nurse navigation for diagnosed patients
- Assigning a nurse navigator
- Coordinating treatment planning
- Shepherding the patient through the treatment phase
- Following-up with the patients post-treatment
- Monitoring patient surveillance.

The team brainstormed the critical touch points between the patient and navigator to determine actions required while the patient is being navigated.

Design Phase

Next, the team generated and evaluated possible high-level design concepts that included those functions and actions that would eventually be built into a detailed program design. The concepts were judged against the customer CTQs and other requirements to determine which concept was "best" and should be further developed into the actual service. Once the high-level design concept was selected, the team identified the necessary design elements for implementation. The team then created design element specifications for process, equipment, human systems, materials/supplies, information systems, and facilities. For example, human systems' elements included job descriptions, an organization chart, a recruitment strategy, a navigator orientation model, and physician/office staff in-service for the web-based database.

After the high-level design and its elements were determined, our team completed a detailed design of the navigation program, a process which included establishing SOPs and supporting systems and structures. The team identified the ideal way to meet patients' needs and to ensure that any patient with an abnormal finding or in need of breast cancer treatment had immediate access to a navigator by designing the program to meet patient and physician CTQs.

Next the team created a pilot plan (Generation I) to verify the design. The team used Failure Mode Effect Analysis (FMEA) to analyze the detailed design process. FMEA
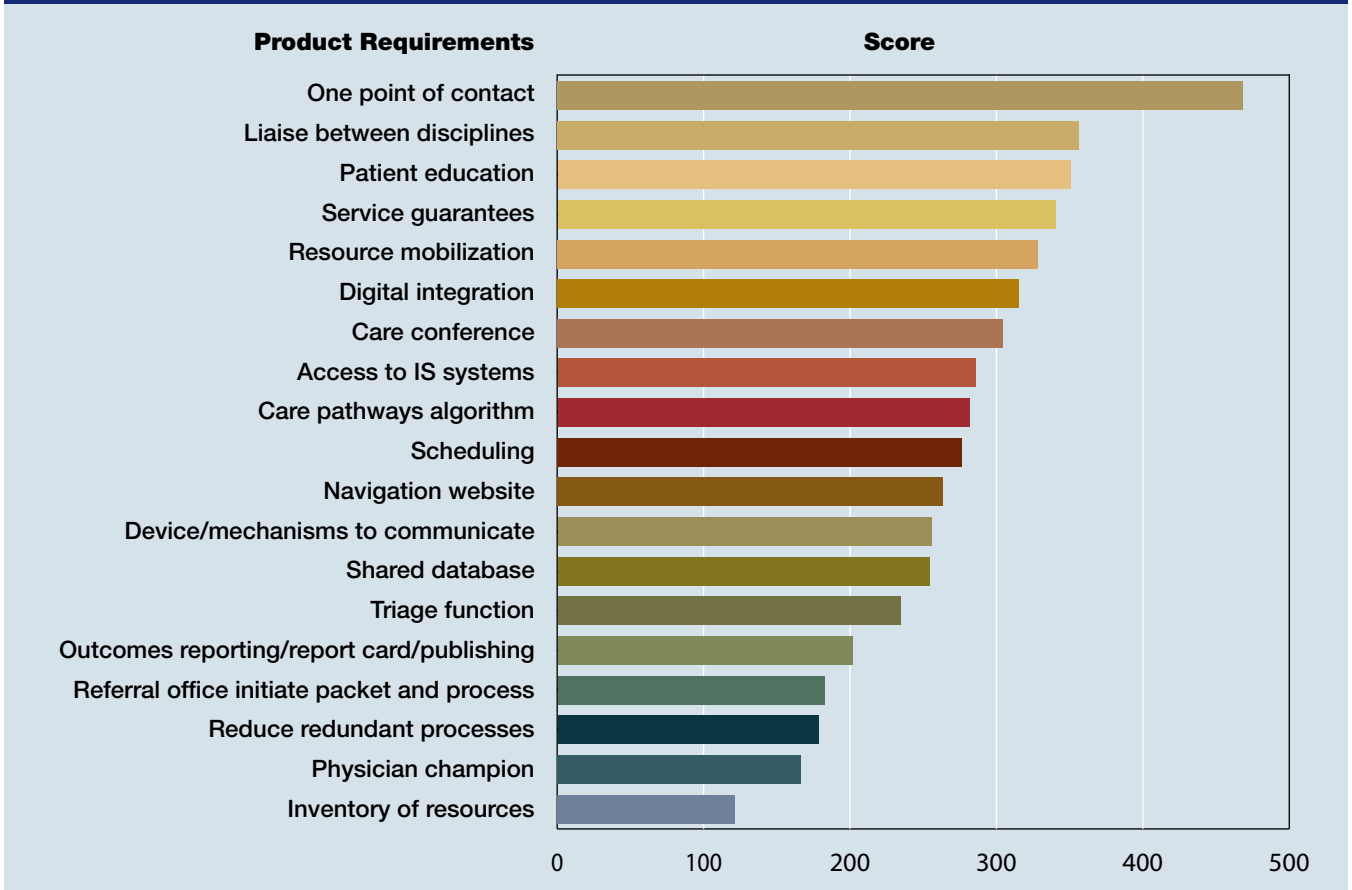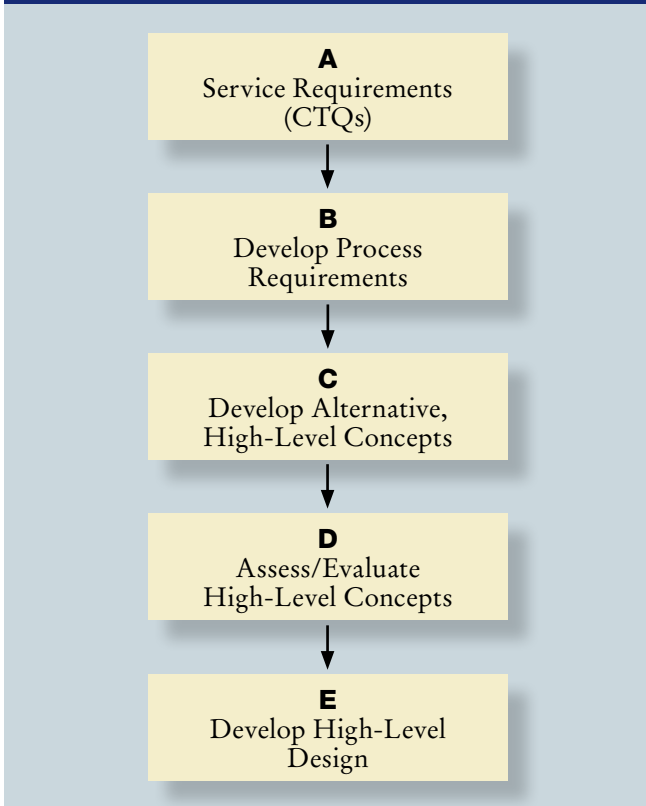
Figure 2. QFD Pareto Chart

Product Requirements | **Score**

Product Requirements	Score
One point of contact	~470
Liaise between disciplines	~355
Patient education	~350
Service guarantees	~340
Resource mobilization	~325
Digital integration	~310
Care conference	~305
Access to IS systems	~285
Care pathways algorithm	~280
Scheduling	~275
Navigation website	~265
Device/mechanisms to communicate	~255
Shared database	~255
Triage function	~235
Outcomes reporting/report card/publishing	~200
Referral office initiate packet and process	~185
Reduce redundant processes	~180
Physician champion	~165
Inventory of resources	~120

(Scale: 0, 100, 200, 300, 400, 500)

Figure 3: Analyze Flow Chart

A
Service Requirements (CTQs)

↓

B
Develop Process Requirements

↓

C
Develop Alternative, High-Level Concepts

↓

D
Assess/Evaluate High-Level Concepts

↓

E
Develop High-Level Design

is a proven, disciplined approach to identifying possible "failures" of a service and determining the frequency and impact of these failures.[10] FMEA is also used to rank and prioritize the possible causes of failures and to develop and implement preventative actions.

FMEA helped the team identify the "failure" with the greatest potential for impact on the navigation process: contact management between the navigator and patients. This potential failure scored high in terms of frequency of occurrence, the severity of impact, and the inability to readily detect the failure's occurrence. The overall high ranking was attributed to the volume of patients a navigator manages and the multiple touch points between a navigator and each patient.

The team's recommended preventative action: include a contact management component within the web-based database. The DFSS team discussed system requirements with Virtua's web development team, part of Virtua's Information and Systems Department. The workflow of the screens and the structure of the underlying database were designed and tested in close collaboration with the DFSS team to build and review the system design, screen displays, and functionality.

Development of the Generation I pilot plan (limited to one OB/GYN physician group and two physician practices) and an associated control and data collection plan were the final components of the Design Phase. The purpose of the pilot plan was to test the design prior to full implementation. The control plan provided an organized approach to data collection. These plans bridged the

Table 4. Pilot Plan

Purpose
- Implement patient navigation program while monitoring service performance, access, and effectiveness in achieving stated goals in accordance to established CTQs

Who
- **Abnormal Mammogram Findings**
  All patients with abnormal mammogram findings who needed surgical consult
- **Diagnosed Patients**
  - 2 patients per week from each of the pilot physician practices for the first month
  - Director of the Breast Care Program will evaluate and increase the number of patients per week based on capacity of 2 part-time navigators
  - Patients randomly selected (e.g., the first 2 patients per practice at the diagnosis appointment)

Timelines
- **Abnormal Mammogram Findings:** 02/01/07-12/31/07
- **Diagnosed Patients:** 07/16/07-03/15/08

Physician Practices
- **Abnormal Mammogram Findings**
  1 OB/GYN practice
- **Diagnosed Patients**
  2 breast surgeon practices

Debrief Sessions
- Scheduled for April, June, August, October, December, and February of next year to review data and process to date

Procedures
- New procedure documented in SOP format with visual aids (flowcharts)
- Other necessary materials and instructions developed and disseminated
- Staffing

Abnormal Mammogram Findings
- The director of the Breast Care Program to navigate patients for surgical consults, 15 hours/week

Diagnosed Patients
- Use existing staff resources with 2 part-time nurses, 20 hours/week, for a total of 40 hours coverage
- The director of the Breast Care Program will ensure 5 day/week coverage and will provide back-up as needed

Stakeholders
- Extensive communication has been provided about pilot to anyone affected by the change and interested parties
- All involved in the pilot understand his or her responsibilities
- Reviewed new documentation and explained new procedures to those involved with the pilot

Measurements
- See data collection plan (Table 5) to monitor key indicators
- Methods and tools developed to document what works, what doesn't work, and who will respond to unanticipated problems

gulf between program design and operations. They also provided ongoing monitoring of the program once fully implemented. The pilot and data collection plans were implemented during the Verification Phase (see Table 4, page 30 and Table 5, page 31).

Verify Phase
In the final phase, the Generation I pilot was initiated, and the "actual" results from the pilot were compared to "expected" results. Where performance gaps existed, corrective actions were identified and implemented. When performance consistently met targeted metrics, the team prepared for full-scale implementation and initiated a plan for ongoing monitoring to ensure program sustainability. Full scale implementation (Generation II) would expand access navigation and nurse navigation to *all* breast care physician practices and OB/GYN practices. Additionally, the team developed an intense, comprehensive, customized

Table 5. Data Collection Plan

Gauge
- Physician staff and nurse navigators on data entry accuracy and data integrity into web-based database.

What
- Key indicators detailed in metrics table for both abnormal mammogram findings and diagnosed patients.

Who
- The director of Breast Care Program to run monthly query reports from web-based database with custom "from date-to-date" option.
- Information will be placed into appropriate control charts to monitor process stability and control, evaluate for trends, and identify course correction opportunities.
- Physician and patient satisfaction surveys will be sent quarterly.
- Raw data will be imported into Excel database for further data manipulation as needed.

When
- By the 5th of each month, the previous month reports are generated and information sent to DFSS team and designated stakeholders as outlined in communication plan.

Report Element
- From date-to-date, tally, percent compliant, exceptions listed with assigned navigator. Exceptions displayed on daily reminder list, YTD tally, and percent compliance.

Communication
- High-level summary report shared by email to project's sponsor and POE AVP. The director of the Breast Care Program will review findings at monthly one-on-one meetings with POE AVP. POE AVP will share any relevant information with project sponsor. Summary report will include MTD and YTD roll-up of "N" and percent compliance for each key indicator.
- Bi-monthly will share key indicator findings with pilot physicians through one-on-one contact.
- Review data at navigator team meetings. Use this to capture what is and is not working.
- Send key indicator findings to DFSS team on monthly basis.
- Provide high-level summary at quarterly Cancer Committee Meetings.
- Report out to system data findings in November 2007 (mid-pilot).
- Date and process de-brief meetings set-up with DFSS team for monitoring in April, June, August, October, December, and February).

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communication plan to disseminate information about the Breast Navigation Program to all stakeholders and departments throughout Virtua that had a particular interest in the program. Also during this phase, the team began to design Generation II of the Breast Navigation Program to foster a smooth transition from the pilot to the full roll-out to all OB/GYN practices and breast care physicians.

The Pilot Program

Virtua's Breast Navigation Program pilot was designed with a two-pronged approach: access navigation and care navigation. In February 2007, the pilot began with abnormal mammogram findings (access navigation) and treatment through surveillance (care navigation) in July of 2007. The pilot program had five global objectives:

1. Reduce delays and enhance patient access to specialists
2. Provide personalized information about cancer diagnosis and support patients in treatment decisions
3. Facilitate timely access to healthcare and supportive services
4. Enhance communication between the various disciplines and referring physicians
5. Create a personalized approach to breast care that differentiates Virtua from its competitors.

The overarching goal was to improve the patient experience and improve cancer care.

Implementation of the virtual access navigation was the first phase of the Breast Navigation Program pilot. The "access navigator" is a non-clinical dedicated scheduler. The scheduler is responsible for obtaining timely access to diagnostic consultations and procedures with specialists. During this phase of the pilot, an existing FTE was reallocated to work with the referring physician, patient, and breast specialist. The process started with the referring physician contacting the access navigator with referral and patient information. Within 24 hours, the access navigator contacted the patient to determine patient preferences for the consult and surgeon; to assess the availability of the surgeon, patient, and physician; and to obtain insurance information. The patient decided which surgeon to consult and, with the access navigator, contacted the surgeon's office via conference call to schedule the appointment. After the appointment was set, the access navigator informed the referring physician.

The second phase of the pilot, "care navigation," focused on diagnosed breast cancer patients. Care navigation started with initial diagnosis through active treatment (lasting on average up to nine months) into surveillance

and survivorship. Two existing 0.5 FTE oncology nurses were transitioned into the care navigator roles. Based on site visits to navigation programs, the team learned that one FTE could navigate approximately 25 to 30 patients in active treatment, with 75 to 80 in post-treatment and surveillance. Therefore, our pilot was limited to two diagnosed breast cancer patients per week per surgical practice. In other words, four patients were identified each week—two from each practice—and divided equally between the two patient navigators. The director of the Breast Care Program, who is a member of the DFSS team, closely monitored the number of patients and increased it based on navigator capacity. The care navigators meticulously followed the detailed SOPs developed through the DFSS process to meet customer requirements.

The ability to monitor and track patient needs was critical to the navigator's success. The aforementioned web-based, user-friendly database captured key touch points at which navigators typically become involved with patients (i.e., after an initial chemotherapy treatment). The system can send automated reminders to the navigator indicating when it is time to carry out a task—a particularly useful system function. Also incorporated into the database are automated patient itineraries and referring physician/PCP communication letters.

This database captures key metrics for monitoring the program's success. Outcome measures include: patient satisfaction ratings, service performance and process requirements, and business objectives. The director of the Breast Care Program can collect, analyze, and monitor these performance metrics using queries which can be run at any time. This tool allows the director to quickly access and track quantitative improvement measures. It also allows for course corrections based on data trending.

Access Navigation Results

The outcomes of access navigation show an improved patient experience, as well as physician satisfaction with the timely care of their patients. Prior to the access navigation project, the average wait time for a Virtua breast specialist appointment was 30 days. Today, the average wait is 10 days, with most patients being seen in less than 5 working days. Before initiation of access navigation, about 50 percent of breast care patients were leaving Virtua due to the psychological distress associated with waiting extended periods for an appointment.[11] Today, patients cite improved quality of life due to more timely reassurance for women with benign conditions and earlier treatment for women with cancer. Out-migration to competitors decreased significantly. Virtua now is retaining 98 percent of the patients referred to its breast specialists. Furthermore, access navigation has increased patient referrals to Virtua's physicians by 48 percent.

Care Navigation Results

The DFSS team developed a series of metrics that reflect patient and physician requirements. We have tracked these metrics from July 2007 to date. Select metrics are discussed below.

Survey feedback received from primary care physicians revealed low satisfaction with the communication around patient diagnosis post-referral to a specialist. Physicians wanted to know the outcome of the specialist consult within two weeks of biopsy results. To address this, the DFSS team developed a CTQ and designed the program to meet it. Upon a positive biopsy result, the patient is referred to care navigation. The metric used to measure contact with the primary care physician was the number of days between patient referral to the care navigation program to the date the letter was sent to the primary care physician. (The letter indicated diagnosis, that the patient is a participant in the Breast Navigation program, the provider caring for the patient, and contact information for questions.) The specification limit was within 10 business days of this referral with a target of 100 percent of the time. Tracked compliance met the target of 100 percent for the first five months of 2008, with one month missing the target due to one letter being sent one day late.

One business metric measures the number of diagnosed, navigated patients who remain within Virtua for surgical intervention. Our goal is to retain 80 percent of these patients. Out of 52 care navigation patients requiring surgery, only 3 sought surgery at another facility in 2007, placing us at 94 percent retention, exceeding the goal by 14 percentage points. During the first six months of 2008, 100 percent of the patients remained within Virtua for surgery.

Another metric tracks the number of surgical patients who receive radiation treatment within Virtua. Here, too, our goal is to retain 80 percent of these patients. From July 2007 through December 2007, 92 percent were retained. For the first six months of 2008, 100 percent of these patients selected Virtua for radiation therapy.

One service metric tracks the number of days from definitive surgery to the initial appointment with the appropriate oncology specialist—radiation or medical oncology. The specification limit was the consult occurred within three weeks of the definitive surgery date, with a target of 100 percent scheduled within this time frame. Our monthly results varied from 83 percent to 100 percent. This target variation was the result of patient availability or patients requiring more time to recover from surgery.

In 2008, we began to track the number of care navigation patients who required chemotherapy and were retained by Virtua physicians. Our goal is retain 85 percent of these patients. Of the 96 patients requiring treatment, 94 percent remained with a Virtua physician. In their satisfaction surveys, patients revealed that being part of the Breast Navigation Program is what kept them from seeking care elsewhere.

The overall goal for satisfaction with the care navigation services was set at 90 percent for both physicians who refer and patients who receive the service. The program has exceeded the goal with 100 percent overall satisfaction. Currently, we are in the process of developing a survey specific to access navigation.

Due to the success of these pilot phases, the Breast Navigation Program became permanent and was approved for expansion. Access navigation is being offered to all OB/GYN practices within Virtua for all their patients in need of a breast specialist. An additional 2.5 FTEs were approved for care navigation. The FTEs will be phased in as referral volumes to the program increase. All breast surgeons will be able to offer this program to their diagnosed breast cancer patients. In addition, patients who self-refer are accepted into the program as a Virtua patient. After demonstrating the success of the Breast Navigation Program, Virtua is extending patient navigation to other cancer diagnoses,

Critical Success Factors

Virtua identified six factors that were critical to the success of its breast navigation program.

1. *Linking the Breast Navigation Program to Virtua's business strategy.* The Breast Navigation Program supports the Oncology POE goal to provide value-added, differentiated services to targeted populations. Additionally, it was directly linked to our customers by understanding their needs and their requirements to meet these needs.

2. *Generating buy-in and support from top-level executives who respected the DFSS process and allowed it to unfold.* Leadership needed to be visible and in the forefront, providing the necessary resources to help achieve and sustain the desired results. Allocating resources to support the team and facilitating access to appropriate resources allowed the team to work in large blocks of time, which promoted focus and maintained momentum. Virtua leadership was the driving force around the initiative for patient navigation.

3. *Leveraging a methodology that provided structure and rigor to the design of the program.* This systematic approach provided a framework to focus the project team and provided a methodology for program development.

4. *Having the right people in the room with cross-functional representation from key areas with subject matter expertise and garnering commitment of physician champions who worked collaboratively with the project team.* Representation from legal, information services, patient business services, and social work, as well as a breast care coordinator, a breast practice administrator, and a breast care director were included on the project team. The different knowledge bases from these participants provided unique perspectives necessary for design. Working together, we were able to create a shared need for the navigation program and shape a vision. Understanding physicians' reasons for resistance and developing strategies to overcome their resistance aided in mobilizing physician commitment.

5. *Maintaining communication with and feedback from stakeholders and engaging key stakeholders at the onset of program design mobilized their commitment for its success.* Communication methods chosen were dependent on the audience and message to be delivered. Methods included face-to-face meetings, letters, and fact sheets, to name a few. One lesson learned from other projects is that you can never communicate enough and, in the absence of communication, people will fill the void with misperceptions and assumptions.

6. *Identification and re-alignment of key systems and structures needed for ongoing sustainability of the program.* Evaluation of the missing or needed structures centered on staffing, development and training, organizational structure, resources, technology, etc. Building the design around process—not people—ensured sustainability of the program. This method includes identifying and monitoring in-process and outcome measures and developing a customized database that both facilitates the navigation process and tracks the success of the program.

beginning with a colorectal cancer navigation pilot. This program is following the framework of the Breast Navigation Program.

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