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Introduction

In 2014, an estimated 235,080 new cases of invasive breast cancer were expected to be diagnosed in men and women in the United States [1]. The disease continues to be a leading cause of death in women, second only to lung cancer. Early detection and diagnosis is crucial to reduce mortality, and screening mammography has been the gold standard for breast cancer diagnosis. A comprehensive and efficiently operating breast care facility is vital to provide the best environment for breast cancer screening and diagnosis.

This chapter will discuss the background of our breast imaging center, the current status, and the required setup. Throughout the chapter, an overview of current practices that allow for optimal patient care will be provided.

An Overview of Elizabeth Wende Breast Care, LLC

Our facility, Elizabeth Wende Breast Care, LLC (EWBC), is located in Rochester, New York, and was established in 1976 [2]. From its inception, EWBC's mission has been to provide patients with the highest quality breast imaging and excellent care that considers each patient's physical and emotional well-being. EWBC has grown to be the largest freestanding breast imaging center in the United States, seeing approximately 80,000 patients annually. Figures 18.1 and 18.2

demonstrate the distribution of our patients from across the state and country.

Our practice has expanded over the years and currently includes a main office which is approximately 33,500 square feet (Fig. 18.3) and three satellite offices: 1,200 square feet (a rural location southeast of the main office), 2,000 square feet (northwest of the main office), and 2,300 square feet (east of the main office). Combined, we serve approximately 420 patients daily: 340 screening, 60 diagnostic, 20 screening ultrasound, eight magnetic resonance imaging (MRI) examinations, and six genetic appointments.

The first floor of the main office is designated for patient care, and the second floor is designated for medical record storage, administrative offices, and the genetics department. The main office, on a bus line and with ample free parking, sees an average of 265 screening appointments and an average of 60 diagnostic appointments daily. The office includes six radiologists, four full-time and two part-time, in addition to a staff of 134 employees, 97 full-time and 37 part-time. The majority of our work is done online (patients have the option to wait for results) from 6:45 a.m. to 5:00 p.m., which can make for a long day for staff and radiologists.

Screening services available include digital mammography, digital breast tomosynthesis, ultrasound, and breast MRI. All examinations are interpreted at the main office, as the satellite office studies are transferred via our extended network circuits to the main office. Each screening mammography examination is read with the use of computer-aided detection (CAD), and same-day results are offered to those patients who choose to wait. For those who do wait for results (approximately 62 % of our population), additional views, ultrasound, and needle biopsy can all be performed during the same visit, if necessary. Whether our patients travel a distance for their appointment, make special

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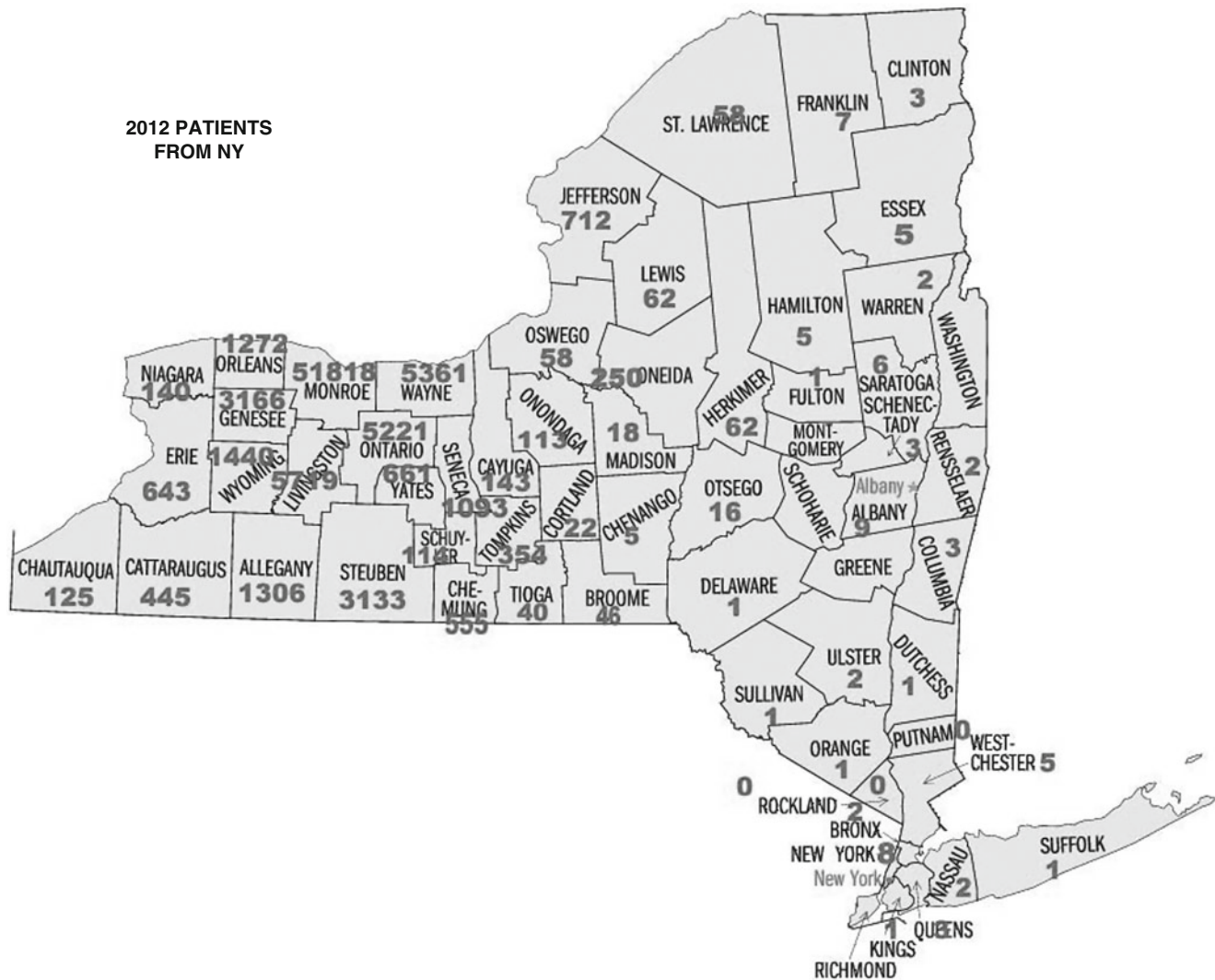


Fig. 18.1 Map of New York State displays the distribution of patients that we serve

transportation arrangements, or are anxious for their results, the option to have the mammogram and additional work-up, if necessary, during the same visit is very important. For those fitting the appointment into a busy life schedule, the option to not wait for results is appreciated.

In addition to the screening services mentioned previously, we also offer diagnostic services which include diagnostic ultrasound, breast MRI, ductography, fine-needle aspiration cytology (FNAC), and needle core biopsy for all imaging modalities (stereotactic, ultrasound, and MRI).

Breast MRI was a modality that was added to our practice in 2003. We began with MRI 1 day per week with a mobile lease and eventually, due to the high patient demand, built an addition to house a permanent unit to be

utilized daily. Having access to an extensive range of diagnostic services has allowed our facility to provide care to a wide array of patients, whether recently diagnosed with breast cancer or those considered at high lifetime breast cancer risk.

As of 2010, we implemented a risk assessment/genetics program and have had a certified genetic counselor on staff since 2011. The process began when we realized patients with multiple risk factors for breast or ovarian cancer had many questions and needed counseling at a level that our current staff could not provide. This program has allowed us to reach out to our high-risk population and ultimately provide additional and potentially lifesaving services, such as screening MRI.

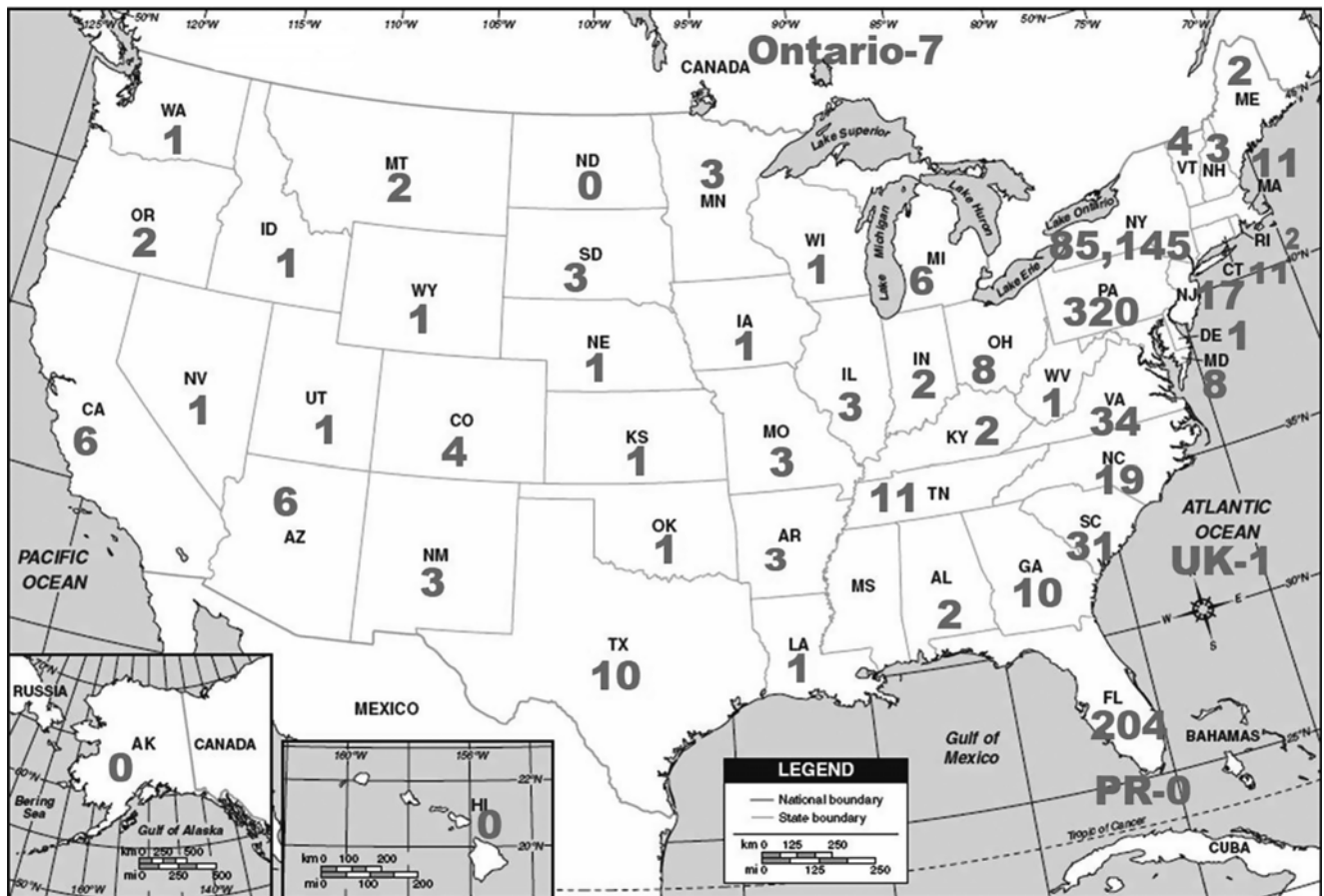


Fig. 18.2 Map of the United States and Canada showing the distribution of patients that travel to our facility



Fig. 18.3 Elizabeth Wende Breast Care, LLC, located in Rochester, New York

Design of a Dedicated Breast Center

When opening a breast imaging center, there are several factors that need to be considered. From the beginning, it is important to know and understand the state and local laws that may apply in your area.

When picking a location, it is important to keep in mind the population of patients you hope to reach. A city location will allow access to patients in many surrounding areas, as the city is often a central location. A rural location will help to reach those patients who may not have access to urban areas. Another aspect to consider is where the imaging center will be located in relation to a bus line. Allowing access for patients without their own mode of transportation is important.

It is optimal that from the very beginning stages, you plan out what services will be offered to patients, but even with the best plans in place, a practice may grow and require additional space to include services not initially anticipated.

When designing the layout of the breast center, it will be helpful to include an architect in the discussion on the services that will be offered and the desired flow of the practice. This will help to design an efficient layout for a seamless daily workflow. Parking availability should also be considered and directly related to the capacity of the building, for staff and patients alike. Additionally, protecting patient privacy and ensuring that practices are conducted in accordance with Health Insurance Privacy and Accountability Act (HIPAA) will need to be considered when designing the center. This needs to be considered from the time the patient checks in and continued throughout the office visit. Most of the health and human services (hhs.gov) [3] sites are an excellent resource to assure proper protection for patient privacy.

The following subsections will discuss the layout of our facility, from patient check-in and visitor waiting room to the mammography and radiologists' suites.

Patient Check-In and Visitor Waiting Room

When a patient first enters the facility, she approaches the front desk staff in the main waiting room. The outside waiting room should include varying-sized chairs or benches to accommodate patients and visitors of all sizes. Armchairs are important for patients with limited mobility who may need assistance when getting to a standing position, while bench-style seating (armless) is important as it provides comfort for the overweight patient who may require slightly more room than the standard chair. A waiting room bathroom should be incorporated, as family members tend to accompany and wait for the patient's visit to be complete. Building codes and specifications will need to be adhered to, to ensure requirements for handicap accessibility are met, for



Fig. 18.4 The original reception area was an open design which did not allow for much privacy while a patient checked in with reception staff



Fig. 18.5 Remodeling of the reception area was performed to ensure adequate privacy for the patient while checking in at the front desk

example, a large doorway for wheelchairs, scooters, walkers, or those requiring extra assistance.

Our front reception area went through remodeling to be designed in accordance with HIPAA. It is essential that the check-in process is as private as possible to protect the patients' protected health information (PHI). Figures 18.4 and 18.5 show the transition of the reception area as the facility adapted to HIPAA regulations. Each receptionist has her own computer and desk, separated from the next receptionist by a glass partition. The partition provides the privacy needed for review of PHI that takes place at check-in (Fig. 18.6).

Aside from the physical design of the outside waiting area, we offer a wide selection of reading materials, as well as herbal teas and decaffeinated coffee, television, and wireless internet for both patients and those who may be accompanying them for the appointment.



Fig. 18.6 Glass partitions divide the reception desk to protect the patients' health information

Patient Waiting Room Design

Due to the volume of patients we service and the fact that some patients may experience a lengthy visit, the office was designed with two inside patient waiting areas. The asymptomatic screening patients, whether waiting for results or not, have a shorter appointment time, approximately 1 h from check-in to checkout. However, the symptomatic diagnostic patient may be with us for several hours for a complete work-up. The decision of designing two separate waiting areas came from past experience; when all patients shared one waiting area, regardless of appointment type, we found that patients were noticing others would arrive after them and leave before them, and this added additional anxiety to an already stressful appointment. At the earliest opportunity (when further space became available), the decision was made to separate the diagnostic patients and the screening patients. Incorporating the two waiting rooms has turned out to be an excellent decision, as the dynamics of each scenario fit the respective waiting room.

The screening changing area contains 10 changing booths and 72 lockers; the screening waiting room allows seating for 51. A smaller waiting room is adjacent to the large screening waiting room; this room is utilized if a patient requires a smaller setting. The diagnostic changing area has five changing booths and 36 lockers; the diagnostic waiting room is smaller allowing for seating for 34. Both waiting rooms have a fireplace and fish tank to promote a tranquil environment. Decaffeinated coffee and herbal teas are offered for patients, along with reading material (Figs. 18.7 and 18.8).

As with the visitor waiting room, it is important to have comfortable chairs for patients of all sizes. It has been reported that patients with weight issues often do not adhere



Fig. 18.7 The waiting room for patients attending screening mammography contains aquariums and a fireplace as it was designed to be a tranquil and serene environment



Fig. 18.8 The waiting room for patients presenting for a diagnostic appointment is a smaller version of the screening waiting room, also housing a fireplace as well as a flat-screen television

to screening tests, but if the environment is accommodating, these patients may be more inclined to keep their appointments [4]. Research has shown that obese women have higher mortality rates for breast and cervical cancer [5], and one bad experience may turn a patient away from a lifesaving screening exam.

Mammography Suites

The main office has ten mammography suites that are centrally located from the two patient waiting rooms. Each room is equipped with a direct ray full field digital mammography (FFDM) unit with attachments and all supplies necessary for the study (Fig. 18.9).



Fig. 18.9 A typical mammography room at our facility



Fig. 18.10 The largest mammography room is utilized for procedures such as ductography and contains a bed to aid with the procedure so that the patient does not need to be transferred to another room for imaging

The largest mammography suite has been designated for localization procedures and is also equipped with an examination table used for ductography cannulation (Fig. 18.10).

Utilizing this larger room for interventional procedures is a benefit, as added staff may be needed during the procedure, such as a nurse, in cases where the patient needs extra assistance. Additionally, in each room, a thin client computer is provided for access to the radiology information system (RIS) and picture archiving and communication system (PACS) (Fig. 18.11). The technologist has the ability to review prior reports and images as well as update electronic health information that may be provided during the patient interview portion of the examination.

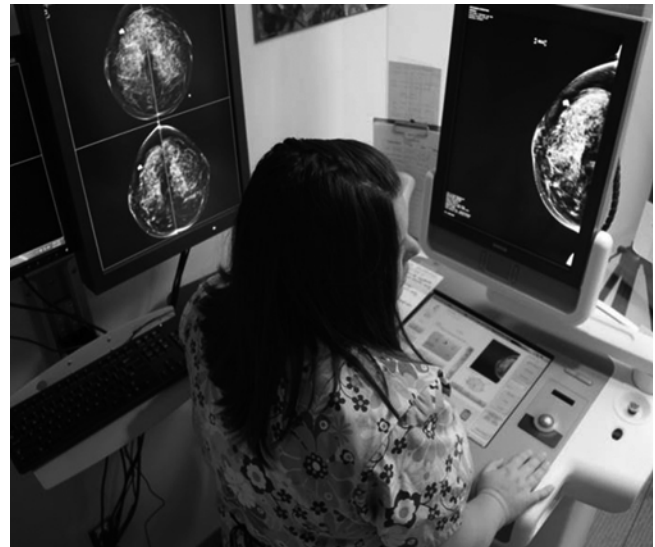


Fig. 18.11 The technologists have access to prior imaging while preparing for the patient in the mammography suite



Fig. 18.12 The radiologists' reading room and examination room can both be accessed from the hallway, as well as by a doorway between the two rooms

Radiologist Suite

Each radiologist at our facility has a two-room suite consisting of a reading room and an attached examination and ultrasound room (Fig. 18.12). There is hallway access to both rooms, as well as an inside doorway connecting the two rooms. This allows the patient to be escorted in from the outer hallway and allows the radiologist to enter the examination room from their reading room (Fig. 18.13). Daily, each radiologist has a medical assistant scheduled with them to assist with patient flow.

The radiologist reading room reflects the current modern, ergonomic design for the digital era. Due to the sedentary nature of the digital reading room, it is crucial that ergonomics



Fig. 18.13 A view into the examination room from the reading room demonstrates the convenience for the radiologist when preparing to examine a patient

be addressed to minimize eyestrain, lower back strain, carpal tunnel syndrome, and fatigue [6]. Each radiologist's office is equipped with a lumbar-supportive chair and a height adjustable desk that can be used for seated or standing reading (Figs. 18.14 and 18.15).

Two 5 megapixel monitors can be height adjusted and tilted for optimal viewing to minimize neck strain. Each room has overhead fluorescent lighting, but when interpreting digital mammograms, it is not used due to the reflective glare on the monitors. Instead, ambient lighting (with a low-wattage bulb) that is located behind the monitors is used. Each radiologist has an ergonomic keyboard and mouse allowing for their hand and wrist to be neutrally positioned. A programmable gaming mouse is used and programmed so that with slight hand movement, the reading protocol can be advanced and CAD can be applied.

The ultrasound room attached to the reading room allows for an efficient workflow for the radiologist. This room is used for clinical breast examination, handheld ultrasound, and clinically guided procedures such as cyst aspirations, antegrade ductography injection, FNAC, and core biopsy. In addition to this attached room, there is an overflow ultrasound/examination room that is shared amongst the radiologists if needed on a busy day. This allows the radiologist to see their next patient without waiting for the turnover and cleaning of the room just used. The combination of having an individual suite and a medical assistant assigned to help maintain adequate patient flow is an important aspect in the design of our facility.

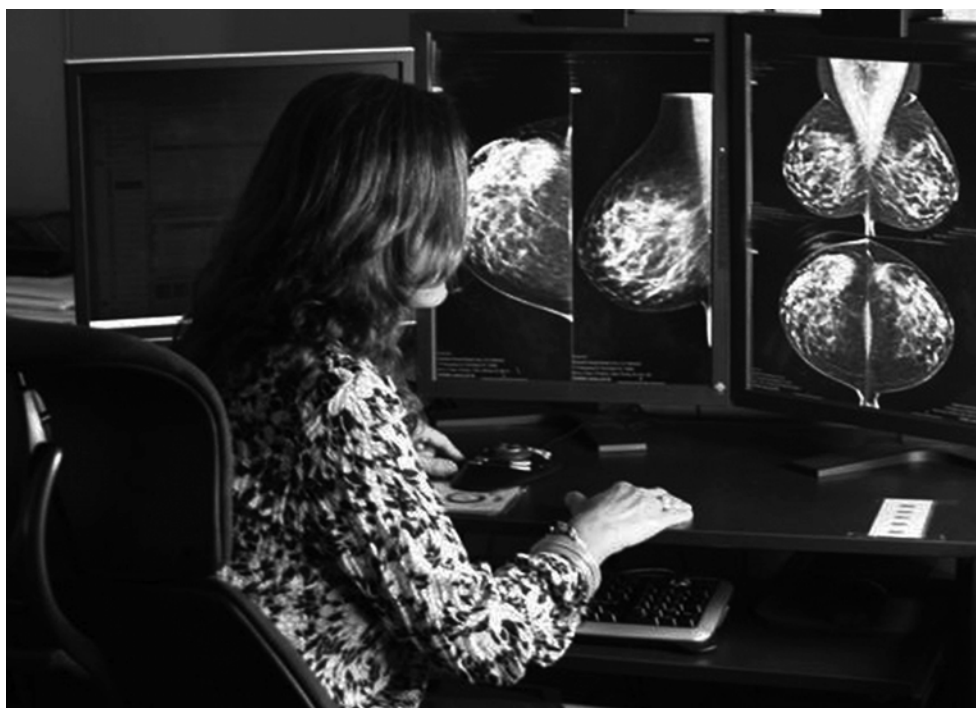


Fig. 18.14 With the new ergonomically designed workstations, the radiologists can read while remaining seated in a lumbar-supportive chair

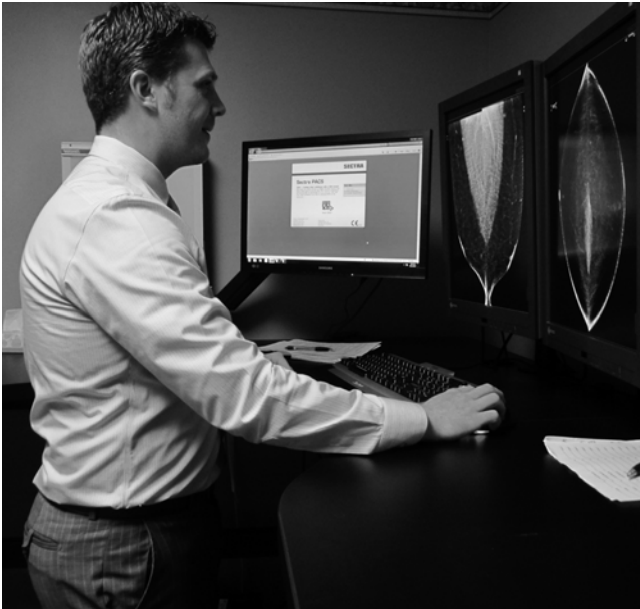


Fig. 18.15 The ergonomically designed workstations can also be adjusted to allow the radiologist to stand while interpreting examinations

Running the Office

This section will review how our systems are integrated to provide a seamless daily clinical workflow.

RIS and PACS

In 2008, our facility became 100 % digital and since then has been converting to a paperless, chartless environment. Our facility uses an electronic proprietary RIS (Avairis). This system is closely integrated with our PACS system (Sectra). The two systems, using bidirectional Health Level 7 (HL7) messaging, have allowed us to follow and manage all aspects of our patients' visits electronically, as well as maintain an electronic chart for each patient.

Our operation has gone through many changes over the years, and it is important to describe the progression that has brought us to the present functionality. Originally, during the time of film-screen mammography, PACS was solely used to view the new digital images as we began to implement FFDM. As the years progressed, our Information Technology (IT) department and PACS administrators have integrated PACS closely with the RIS. Prior patient information has been added into the patients' record on PACS to ensure that all information on a patient is directly available to the radiologist. In the transition from film screen to digital, film images have been digitized into PACS. Additionally, all radiology reports have been tied into the exams in PACS and can be viewed directly alongside the images. Personal and family history and prior needle or surgical biopsy information are

also now included in PACS and can easily be viewed by the radiologist while reviewing a case. Changes such as these have allowed the radiologists to read all examinations from their own workstations within their own offices.

Today, when a patient schedules an appointment, a message (made possible with HL7) containing appointment information is sent to PACS. PACS performs an automatic "pre-fetch" of prior images from archive the night before the appointment. All prior images will be available for the radiologist to review and compare with the current examination.

During the appointment, PACS will send an HL7 message to the RIS when the radiologist has completed reading the examination. Immediately after screening examinations are interpreted and marked by the radiologists as normal, a message is sent to the RIS, the patient result letter is automatically printed, and the date of the next appointment is set for the patient. Once the letter is printed, the medical assistant knows that the patient's visit is complete and can then give the patient her results. At the same time, the report is also automatically sent to the patient's referring physicians, and the name of the reading radiologist is sent to the billing program in the RIS and charges are posted.

When a radiologist needs additional imaging, they will mark either "finding" or "assessment" on the exam in PACS. If "assessment" is marked, this is a request for extra mammographic images to be performed. A message is automatically sent to the RIS where an extra view/exam is created on the "dashboard" (which will be explained in the next section) and is available for the technologist. The process will repeat itself until the patient is marked as normal. If "finding" is marked, which means the additional mammographic views are obtained and the radiologist is still concerned about the area of investigation, a message is automatically sent to the RIS to create a new exam for an ultrasound, and the patient will present on the ultrasound "dashboard" for the sonographers or the radiologist, converting the exam to a diagnostic appointment.

Dashboard

The "dashboard" that has been mentioned previously is a feature of Avairis that is used to electronically track patients during their appointment at our facility. The dashboard is used by staff members and departments that have direct patient care (Fig. 18.16).

At the start of the day, all patient names are pre-populated to the dashboard through appointment scheduling. Once the patient enters the office, a staff member at the front desk, who is logged into the "greeter view," will begin the movement of the patient as she/he proceeds through the stages of the appointment. This is done electronically by dragging the patient icon on the dashboard to the next step in the visit. The movement of the patient on the dashboard immediately

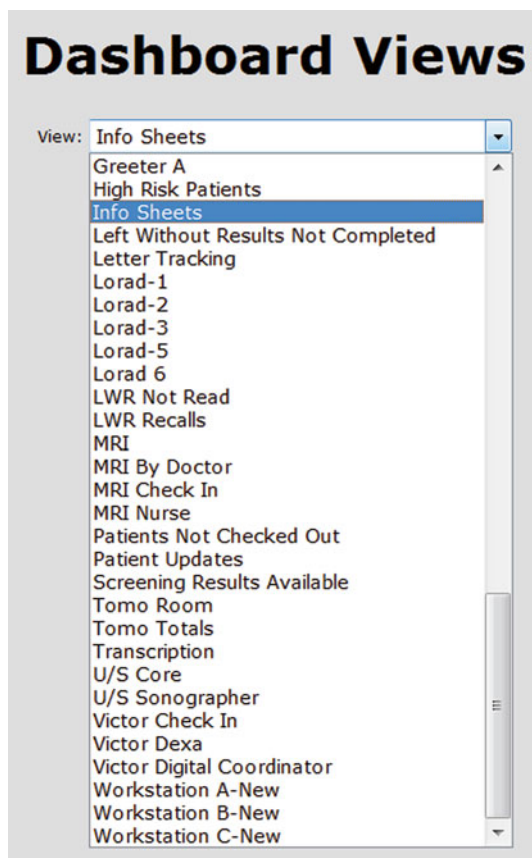


Fig. 18.16 The dashboard is used by all departments within our facility and was created with many different views depending on the needs of the department or individual staff member

notifies the next staff member who will interact with the patient that she/he is ready. For example, once Mrs. Smith has completed check-in and is ready to be brought back to change for the examination, her name will appear on the “bring back” dashboard. This alerts the designated staff member to bring her to the inside waiting room. The patient will then show on the digital coordinator’s dashboard, and the coordinator will move the patient into one of the available mammography rooms. The technologist assigned to that room will then see she/he has a patient and will begin the exam. When she/he begins and ends the exam on the dashboard, HL7 messages will be sent to PACS to change the status of the patient. This process continues throughout the patient’s appointment at the office and messages are sent between the RIS, PACS, and our Dolbey reporting system as well.

Department Functionality

The ability to have a highly efficient breast center requires having all the necessary departments with specific expertise interact with one another. The following will discuss the important roles of each department in our facility.

Call Center/Front Desk (Reception)

The front desk (reception) and the call center share a group of 25 employees that rotate between the two departments. The call center is the first impression of the office, and it is essential to have knowledgeable staff answering the calls in a timely fashion. This department answers approximately 850 calls daily.

After an automatic triage the patient is directed to screening, diagnostic, bone densitometry, or MRI scheduling. These calls average 1 min in length. A select group of employees (medical assistants and select call center staff) rotate through diagnostic scheduling. It is important that these individuals are well trained and very familiar with breast problems and the urgency of particular symptoms. In addition, the diagnostic schedulers need to have a complete understanding of the office workflow and the doctor’s schedules in order to properly inform the patient of the time that should be allotted for the diagnostic appointment. This knowledge base helps minimize diagnostic scheduling errors which ultimately results in high patient satisfaction.

The call center staff is also responsible for managing patients who were auto-scheduled for their next screening visit. This is automatically generated at the end of their last routine screening appointment. The call center staff will mail out a health history form 45 days prior to the appointment. An automated phone message is also in place to remind patients of the upcoming appointment 2 days prior to the appointment date.

Front Desk (Reception)

Upon entering the building, the patient encounters the front desk employees for check-in in the outside waiting room. A receptionist will greet the patient, confirm the appointment is scheduled correctly, and ensure that the health history form is completed (which is sent by mail prior to the appointment date). Once these requirements have been satisfied, the greeter will send the patient on to check in. The check-in receptionist will confirm patient identification (ID) by photo ID. Patients are asked to electronically sign two consent statements: one confirms that the patient has read our facility privacy statement and authorizes us to obtain their medical information as well as use their medical information for education and research purposes; the other confirms the patient has read and understands our facility policy regarding insurance. Insurance information is verified and the current insurance card is scanned to ensure we have the most up-to-date subscriber number. Two full-time employees verify all insurance information in advance, but if any questions arise, the receptionist has the ability to check insurance eligibility through the internet right at the front desk. As part of our genetics program, the receptionists also verify with the

patient that we have the correct personal and family history of breast cancer information in the electronic record.

If the patient presents for a diagnostic appointment and has brought outside films or digital images with her, a reception staff member will sort through the films and reports. The films will be provided to the medical records department for digitization into PACS, or with digital images; the medical records department will upload into PACS. For a diagnostic appointment, the patient is also asked to bring in outside radiology and pathology reports for the radiologist at our facility to review. Based on the type of diagnostic appointment (e.g., second opinion, check-up, new problem), the chart is brought either to the radiologists' reading room to order specific mammographic views or directly to the technologist to perform routine mammographic imaging.

Technologist Department

The technical staff consists of 35 mammography technologists and three sonographers, 19 full-time and 24 part-time (part-time hours range from 25 to 38 h weekly). The technologists cover the main office as well as the three satellite offices. One technologist has an additional certification in MRI. Years of experience in breast imaging range from 1 to 30 years, with some spending their entire career at our breast center. Eleven technologists assist through a rotational schedule with stereotactic core biopsies, and three rotate through the MRI department. Seven technologists perform quality control of the units with two specifically supervising the compliance aspect of quality control. Each day, two technologists are scheduled late; these two stay until all imaging and interventional procedures for the day have been completed.

Technologist training is crucial for the success of the facility. It is important that newly hired technologists undergo training by those most familiar and knowledgeable with breast imaging and particularly with the philosophy of the breast center. The four most senior technologists at our facility are assigned with training the newly hired technologist. They follow a training curriculum that begins with screening examinations, leading up to diagnostic imaging. Training may take upward of a year to complete.

The main office has ten FFDM rooms, three of which have tomosynthesis capabilities (Fig. 18.17). Each mammography room is scheduled with two technologists per day. The technologists scheduled to a particular room will see their patient's name come up on the dashboard and will place the patient to an "in progress" designation when she/he is ready to begin the exam. The technologist goes to the waiting room (either the screening or diagnostic room, which is indicated by a color code on the dashboard) and escorts the patient into the mammography room. The patient's name, date of



Fig. 18.17 Three of our mammography units are capable of tomosynthesis imaging

birth, and reason for exam are confirmed by the technologist prior to imaging. After the images have been obtained, they are checked for proper technique, correct labeling, subject motion, and general quality before the patient is escorted back to the waiting room.

Daily, four technologists are assigned to be available to assist with stereotactic biopsies, when the examination is ordered. When not assisting with stereotactic biopsies, these technologists are performing diagnostic or screening mammograms. Our facility has two stereotactic prone biopsy tables and performs an average of five (range 6–22) stereotactic biopsies daily. Generally two technologists, or a technologist and a medical assistant, will be responsible for each biopsy performed. Their duties include retrieving (printing) the necessary images for review, room and biopsy equipment preparation, escorting the patient to the biopsy room, patient preparation (pre- and post biopsy), and positioning the patient so the radiologist can be called upon for a "biopsy-ready" patient [7]. Post biopsy, the technologist will hold pressure and bandage the biopsy site as well as review printed post biopsy instructions with the patient. The patient will be called by the radiologist in the next 24–48 h with the results of the biopsy. Any imaging, such as post biopsy clip placement views, will be performed by the same set of technologists who assisted with the biopsy. The technologists will then clean the room in preparation for the next pending biopsy.

Managing the patient flow via the dashboard in the technologist area is an integral part of assuring that the patients are imaged in a timely fashion. This duty is performed by the digital coordinator (typically the control technologist), who will route patients to prospective mammography rooms. This allows for the most efficient use of the mammography rooms and technical staff. In addition, the digital coordinator will

review any comments regarding special needs or concerns, the patient's breast density, and history or risk of breast cancer, as these factors play a role in the decision of which room the patient will be assigned to. The digital coordinator is able to see the progression of the exam in the mammography room through a web-based PACS and assigns the next patient to be imaged accordingly. The technologists in the mammography rooms and the digital coordinator have the ability to communicate with each other through instant messaging; this is useful in that communication between the technologist and coordinator remains open, as occasionally a patient may need additional time or the technologist requires additional help with positioning a difficult patient. This allows the coordinator to route the next patient to another room. Throughout the day, patients requiring additional views after screening mammography will reappear at the top of the dashboard list, and the color will change to red (a visual). The digital coordinator will expedite such an exam to the next available mammography room due to fact that the patient has already been waiting after routine imaging.

Medical Assistants

Our facility has 17 medical assistants who work closely with the radiologists daily. Their duties include examination room preparation, escorting the patient back and forth from the waiting room, patient preparation in the ultrasound room, ultrasound assistance, biopsy preparation and assistance, billing assistance, and follow-up visit scheduling. In addition to direct patient care, the assistants rotate through the following positions:

- Digital hanger: Each mammography examination is individually confirmed to be in the correct hanging protocol prior to the radiologist read. Once confirmed, these images are then sent to the radiologists' workstation for interpretation.
- Diagnostic recall scheduler: Phone calls are made to those patients who have been recalled from a screening mammogram to schedule further imaging evaluation.
- Screening results: Normal results from screening examinations are given by a medical assistant. The patient is also informed of her breast density (per the new 2013 New York State law). The assistant will answer any questions the patient may have regarding the visit after discussing with the radiologist.
- Lab coordinator: Paperwork (laboratory requests and labels for specimens) is prepared for patients having a biopsy procedure.

Ideally, the most efficient daily workflow is to consistently have five radiologists each scheduled to see 15 diagnostic patients; true diagnostics (those presenting with a new concern), second opinions, checkups, and recalled patients from

screening. In addition to the diagnostic schedule, each radiologist will read a portion of the daily MRIs. If there is a cancellation and enough time allows, the call center staff will try to fill the opening with another diagnostic patient from the waiting list. This scheduling works best for assistant staffing, imaging capabilities, and overall capacity of the building and parking lot.

In addition to the radiologists' diagnostic schedule, each will be assigned to read screening examinations throughout the day. Reader assignment is an automatic process that occurs as the patients are imaged. The screening examinations of patients waiting for their results are put in the correct work-list to be read by the radiologists. These patients, if requiring further work-up, will also be added to the radiologist's diagnostic schedule. The medical assistants help to ensure the radiologists continuously read the screening examinations of the patients waiting in the office for results [2]. The assistant will notify the radiologist specifically when there is a patient who has been waiting longer than usual as well as inform the radiologist when additional imaging that was requested is ready to be reviewed.

When the patient is ready to be seen by the radiologist, the assistant will escort the patient to the ultrasound suite. After reviewing the current study and any priors, the radiologist along with the assistant will join the patient in the examination room and go over medical history and existing problems. Physical examination and ultrasound are performed by the radiologist, with support of the assistant, and the results are then discussed with the patient. If a biopsy is determined to be necessary due to a suspicious finding, the radiologist will discuss this with the patient. The patient is most often told the biopsy can be performed right away, unless medically discouraged for reasons such as Coumadin or aspirin use. Most patients are thankful to be able to have the biopsy performed at the time of the appointment, but a few may choose to reschedule. The assistant will prepare the necessary paperwork as well as prepare the biopsy tray. If an ultrasound-guided biopsy is to be performed, the assistant will provide support with the procedure. After the biopsy and after post biopsy care is provided, the patient is given written aftercare instructions and the cell phone number of the radiologist, should any concerns arise after the procedure. Specimens are sent out to local laboratories for results which are usually available within 24 h, unless it is late in the day, Friday, or before a holiday. Each patient is called with the results personally by the radiologist who performed the biopsy whether the results are benign or malignant.

MRI Department

A brief history of incorporating breast MRI into our practice was provided earlier. The MRI addition to the building has



Fig. 18.18 The MRI department has a separate entrance, creating a quiet and calm environment



Fig. 18.19 View from the MRI technologist's workstation while scanning a patient

its own entrance and reception area, which adds a quiet, less congested atmosphere (Fig. 18.18).

The MRI department staff consists of two full-time office employees that assist with insurance pre-authorization, scheduling, and MRI contraindication screening. A nurse is on staff for intravenous access, for contrast injection, and for any emergencies or reactions that may arise. Three MRI trained technologists (one with MRI certification) rotate between the mammography department and MRI department, assisting with scanning and MRI-guided biopsies (Fig. 18.19).

Interestingly, in 2003 when first incorporating breast MRI, the majority of the examinations performed were for presurgical extent of disease evaluation; today the majority of the breast MRI examinations performed are for high-risk screening, reflecting the transition within our MRI practice and the implementation of our high-risk and genetics program (Fig. 18.20).

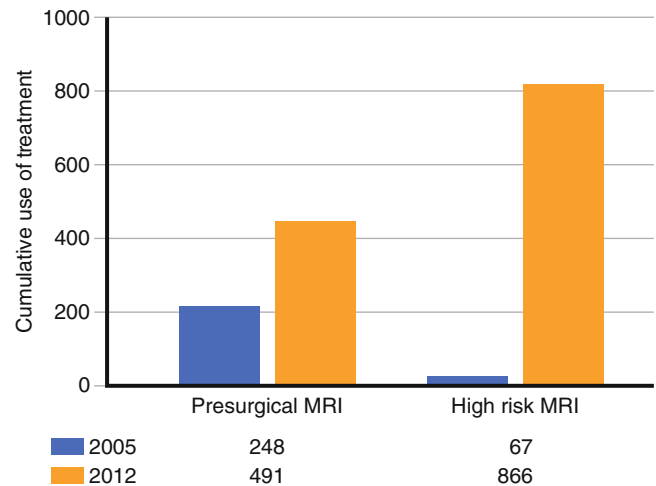


Fig. 18.20 Over the years, we have seen a change in the distribution of indications for breast MRI. In 2005, examinations performed for pre-surgical assessment were the most common; however, as of 2012, examinations performed for evaluation of high-risk patients had become more frequent than any other indication

Genetics Department

The need for a genetics program was based on several factors for us; the number of high-risk MRIs we were performing steadily increased over the last several years; our physicians found themselves spending a larger amount of time counseling patients regarding their risk of breast cancer, and patients were increasingly initiating the discussion with staff during visits at our facility. It has been estimated that approximately 1.4 million women in the United States have family history of breast cancer that, based on criteria established by the US Preventive Services Task Force (USPSTF), permits referral for genetic counseling and potentially genetic testing [8, 9]. Yet fewer than 2 % of respondents who would be candidates for genetic counseling report having been tested [8]. We began to understand that there was a need in our community for genetic counseling and testing, and being a comprehensive breast center, we felt it would be an important service we could provide to our patients.

We began to implement the program by utilizing the health history forms completed by patients. When a patient checks in at the front desk, the medical history information is entered by reception staff into the electronic dashboard. Patients are flagged if the responses on the health history form meet specified NCCN (National Comprehensive Cancer Network) guidelines [10]; high-risk flagging is based on two points (Table 18.1).

Letters are generated based on the high-risk flagging through the dashboard. Initially when we first began to implement this program, our nurse and a trained medical assistant called those patients who were flagged as potential

Table 18.1 High-risk flagging is based on a two-point assessment

Risk factor	Point assessment
Any family history of ovarian/cancer	Each occurrence, 1 point
Personal history of cancer age 50 and over	Each occurrence, 1 point
Personal history of cancer age 50 and under	Each occurrence, 2 points
Ashkenazi Jewish ancestry	1 point

high risk. We have found that approximately 17 % of our patient population is flagged as high risk. As the program progressed, we found that the demand was too high for our staff to keep up with, so we made the decision to hire a certified genetic counselor part-time. The need continued to grow and the position is now staffed full-time. The counselor now works with a trained medical assistant who fields an average of 30 calls daily. The assistant screens patients over the phone to determine if the patient is eligible to continue on to genetic counseling and/or testing. When a patient is determined to be eligible for counseling, the counselor performs a detailed interview. This helps to determine if the patient is eligible for testing. The primary model utilized is Tyrer-Cuzick risk assessment. Gail model or BRCAPRO may be used when Tyrer-Cuzick is not all inclusive for the particular patient; for example, if the patient has male family history, Tyrer-Cuzick cannot be used as it is not incorporated in the risk assessment with that model. All patients who undergo testing are asked to return when the results are available to have a discussion with the counselor as there is much to be discussed that can be quite detailed and complicated. The results are discussed, as well as the implications for the patient's family, and recommendations for medical management are provided. To date we have had 34 positive test results. By identifying patients with genetic mutations, we can review recommended medical management strategies for these patients, including breast MRI, preventative surgery, and/or chemoprevention. Patients can discuss results with their primary physician and establish a customized medical management plan. This helps us to provide the most comprehensive care we can to our patients.

Patient Advocates

Three patient advocates are utilized in our main office to help ensure that we meet the needs of our patients (Fig. 18.21). These staff members provide our patients with personal support and often provide immediate answers to questions a patient may have during the visit. These individuals check in with each inside waiting room at 30 min intervals to determine if there are any patient needs and questions they can address. In some instances, a patient advocate will become involved when a patient will require additional



Fig. 18.21 The patient advocates are always available to ensure that all patients' needs are met throughout their visit at our facility

imaging by talking to the patient about the fees associated with the additional views. This interaction is beneficial as it will allow the patient to become aware of the additional billing involved.

The advocates also serve as a liaison between the radiologist and the patient to assist with, for example, a newly diagnosed cancer patient who may ask about support services. In such an instance, our advocates can supply information about support groups and provide the patient with contact phone numbers.

Additionally, these staff members are often called upon to assist with a patient who has special needs or a patient who is anxious. For example, if a diabetic patient is in need of something to eat, the advocate will provide a light snack and juice. For a nervous patient, it is not out of the ordinary for an advocate to sit by her side through the whole appointment. The advocates also assist with patients who are underinsured or not insured at all. Our facility works closely with a government-run organization in our region that helps provide funding for uninsured patients. If a patient comes in with no insurance, a patient advocate will call this organization (Cancer Services) and help to qualify the patient for coverage. Over the last couple years, due to the high volume of patients currently under- or uninsured, we have opened up our schedule on several Saturdays throughout the year to screen these patients. Our patient advocates help coordinate this in association with Cancer Services, and on average, 65 patients will be scheduled. In addition to imaging, radiologists are present to perform physical examination and complete the breast care for these patients. This program is very important to our community as it provides care that may otherwise be unobtainable.

Transcription Department

The transcription department is staffed with four full-time employees and one part-time employee. The transcriptionists transcribe and edit approximately 140 diagnostic letters per day utilizing Fusion Text and Fusion Speech through Dolbey & Company, Inc. The text dictated by the radiologist is reviewed for clarity and accuracy by the department staff. All information contained in the text is verified through the use of available programs such as PACS and the RIS. Required billing and coding information is added if not present in the original text. Upon completion of the necessary edits, the document is provided to the radiologist for a final review and electronic signature. Once the radiologist signs off on the report, it is sent to the referring physician through a variety of methods as requested by the referring physicians, including faxing, mailing, or electronic delivery. There is also a built-in electronic delay in transmitting the reports to the referring physicians to allow time for our auditing staff to communicate any additional changes required to transcription staff. The majority of the reports are sent out within 24 h. Any additional changes that are required after the report has been signed and transmitted to referring physicians are made and sent as an amended document.

Billing Department

Our billing department is staffed with five full-time employees. Four are Certified Medical Coders and one is a Certified Professional Coder (CPC) with a Certified Evaluation and Management Coder (CEMC) specialty. In a private practice it is important to collect all reimbursement assigned per service performed. The overhead is very high, and in order to maintain the building, the equipment, and the staff, we have hired billing specialists to help us achieve the highest possible collection rate. After a patient has completed her visit, a billing sheet is generated to reflect the services provided, which is sent to the billing department for auditing. Before being processed to the insurance company, all billing sheets are audited for clarity; this is done by matching up the procedure and diagnosis codes to the examination report that will be sent to the referring physician. Once payment has been issued from the insurance company, it will be applied to the patient account. Our billing department will work with patients who have large out-of-pocket expenses due to high deductible insurance plans. These patients are given the ability to pay a monthly installment. The billing staff also offers large discounts to patients who cannot afford our services.

In addition to submitting to the insurance companies, every 2 weeks staff members are assigned to investigate claims for payments that are overdue (over 30 days). It is necessary to follow through to determine why the payers

have not issued payment. This process is an important check to assure that “timely filing” (a rule in place by insurance companies to guarantee proper payment) is in place, so the center will not lose out on the claim. Periodically our CEMC specialist will check insurance websites to ensure the office is working in accordance with billing procedures and coding procedures. Additionally, this employee will run internal audits once a quarter to periodically check for accuracy. The results of this audit will be discussed with staff members; this allows us to determine where improvements can be made, with the hope of increased reimbursement rates.

Medical Records and Record Retention

The medical records department is staffed with five full-time employees. These employees oversee all aspects of maintaining the physical medical record, as well as burning compact discs at the request of the patient or referring physician. As our center is working toward an electronic chart, we still utilize a physical chart for all diagnostic and MRI appointments. Because of this, film requests and chart preparation are conducted several days ahead of the appointment. The medical records department staff also downloads patient studies from outside facilities into PACS and digitizes outside analog films so that the exams are available to the interpreting radiologist for comparison at the time of the appointment. Additionally, patients can drop off films or request images 5 days a week after the proper paperwork has been obtained.

Approximately 235,000 patient charts are stored on-site in a 3,470 square feet area with an additional 40,000 stored off-site at a secure location. Our policy is that a chart will stay on-site and never be destroyed if a patient has had a diagnosis of breast cancer. If the patient is deceased, the chart will be sent to off-site storage, but will never be destroyed. If a patient has not returned to our center in 10 years, the chart will be destroyed. All charts of deceased patients will be stored at the off-site location for 10 years and then destroyed.

IT and PACS Department

The IT and PACS department is made up of five full-time employees and one part-time employee. One staff member oversees all aspects of the dashboard, working on development and maintenance with the programmer. Two staff members manage PACS and are available to troubleshoot on a daily basis with staff members throughout the office. The PACS managers ensure that all exams are pre-fetched for the day. The PACS managers were integral to the transition of our facility to digital. The remaining members of the depart-

ment serve as Windows Systems Administrator, Linux and Network Systems Administrator, and IT support. These staff members oversee the network and all system programs. Due to the electronic nature of our practice, the IT and PACS department is extremely vital to our daily operation. As we continue to make improvements within our facility, whether it be to establish a more efficient workflow or to integrate a new imaging modality, our PACS and IT department continue to play a major role. They address issues as they arise and work to ensure workflow is minimally interrupted when there is a problem. The department has helped to give us the ability to transition to a chartless environment.

Medical Outcomes

One full-time employee and two part-time employees electronically track all biopsy patients and collect all surgical information. This department is crucial for regulatory reporting, such as for Mammography Quality Standards Act (MQSA). This department also updates the electronic chart of every patient that is seen for an abnormality or is recalled from screening.

Human Resources

Our center has a dedicated human resource manager whose primary job functions are to hire new staff, research and implement benefit packages, assist with disability claims, manage payroll, and protect the rights of the employees while adhering to the rules and regulations set in place by the office and the government. The human resource manager has an open-door policy in place for grievances as well as suggestions.

Office Management and Marketing

Management

With any service-oriented business, it is crucial to maintain positive office morale and retain good employees. The office philosophy regarding staff has been to provide good benefits, competitive wages, and flexible work schedules in a safe environment. We cross-train the office staff to minimize job burnout and post new job openings to allow staff to migrate to jobs within the facility [2]. Having 134 employees and acknowledging the specialties of each department as well as maintaining open communication has been the key to maintain office morale.

Staff suggestions are welcome and often changes are made based on these suggestions. Each department has at

least one team leader who is the supervisor. The team leaders are responsible for training new staff, updating department policy, maintaining the department schedule, and coordinating the department vacation schedule. The team leaders from all departments, along with the office manager, facilities manager, and human resource manager, hold weekly meetings during which time policy changes and office issues are discussed. This open flow of information between departments enables us to provide accurate and efficient services for our patients. The meeting notes are transcribed into a weekly office memo and are provided for the entire staff to ensure continued education for all.

With the costs of medical services increasing every year while reimbursement continues to decline or remain flat, radiologists are forced to be both a medical doctor and business manager. Practices are forced to make adjustments in all areas of their business. It is important to periodically evaluate contracts and renegotiate with insurance providers. When doing so, it is important to report on expenses. Our facility uses the relative value unit (RVU) cost analysis for this, as this will provide information on the cost of a procedure in comparison to provider reimbursement [11]. Being aware of your clinical outcomes and reporting on this information will provide the biggest advantage when negotiating with payers, proving that your service is providing excellent patient care.

Marketing

A facility will need to expend time and energy into retaining existing patients and recruiting new ones. The marketing plan should be revised yearly to adapt to the constantly changing medical climate [11]. Marketing your practice can be done by a number of methods. One method that we continually use is to solicit feedback through surveys from our patients and referring physicians. These surveys help us measure our patient and referring physician satisfaction level and provide us the knowledge that allows us to make changes that have a substantial impact. Patient and referring physician satisfaction will be the best source of marketing. If a patient receives exceptional care, it will be spread through word of mouth, as will a negative opinion if a patient is unhappy with the care received. The same goes for the referring physicians. It is crucial that a center maintains and exceeds the expectations of the patients and the referring physician base. During the office visit, we strive to satisfy the patient by prompt and courteous appointment scheduling, a respectful and pleasant check-in at the front desk, and a knowledgeable and efficient technologist interaction during imaging.

Outside of the office, a complete interactive website that is easily searchable is used to educate and inform new patients and returning patients. Educating the community is

important; this can be done through fundraising events (American Cancer Society's Making Strides Walk) and support groups (Gilda's Club and American Cancer Society). Participation with local organizations is a good way to market the center with a visual presence. It is important that a successful center continues to lead the market with clinical and operational excellence as well as constant improvements to stay on the cutting edge.

New Technologies

A comprehensive breast center not only will need to stay informed of new technologies entering the field but will need to embrace and incorporate these technologies into practice. Our facility has a research department staffed with four full-time employees who coordinate clinical trials involving new breast imaging modalities. Over the years we have continued to add and also modify our daily workflow for research projects. The radiologists' role in research is conducted, for the most part, after hours. This has been as important as it allows our facility to stay current with technology and new modalities coming into the market. Digital breast tomosynthesis, breast computed tomography, automated breast ultrasound, ultrasound elastography, and CAD are examples of projects, both past and present, that we have participated in at our facility. Our patients have a very positive attitude toward research; they are willing to participate in studies that evaluate these new technologies. Our patients drive us to continue research as they question and demand better breast care and improved diagnostic techniques.

Conclusion

The design and operation of a comprehensive breast imaging center is critical to ensure effective workflow and daily operation. Seamless workflow is acquired through departments interacting and working in tandem. The support of the staff such as medical assistants and technologists helps to lighten the workload for the radiologists, allowing them to have the time necessary to evaluate a greater number of patients. Interoffice planning, communication, and education foster this proficient environment. This philosophy

has proven beneficial as shown by a recorded patient return rate of 90 % from 2011 to 2012. It is always important to remember that breast cancer screening can be an emotional experience for a patient; having highly trained staff that are in tune to the needs of the patient is imperative for the success of the facility as well as patient satisfaction. Our mission has been, and always will be, to provide quality breast imaging and excellent patient care, considering the patients' physical and emotional well-being.

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