

Going digital

Careful planning can ensure that a conversion from analog to digital mammography delivers the expected benefits in patient care, clinical efficiency and financial success

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In today's competitive imaging market, the benefits of converting to digital mammography are hard to ignore. The Digital Mammographic Imaging Screening Trial (DMIST), a research study sponsored by the U.S. National Cancer Institute, has created strong momentum for digital technology by validating its superiority for young women, for women with dense breasts, and for women who are pre- or peri-menopausal.

Facilities wishing to invest in women's imaging have quickly recognized the clinical, operational, and economic benefits of digital technology. However, lured by these benefits, many facilities are racing to convert from analog to digital mammography without understanding the complexities of the process. The common misconception is that because digital conversions in other modalities have been fairly pain-free, the same will be true of mammography.

In reality, mammography is different. Converting to digital mammography means more than replacing one piece of equipment with another. It means building a complete imaging workflow that includes image capture, distribution, review, and archiving. It means compliance with the Mammography Quality Standards Act (MQSA), which does not apply to other modalities.

In addition, because mammography screening and diagnosis rely on review of prior studies, the digital process must interact in some way with older analog images. Meanwhile, mammography remains a lower-margin offering, unforgiving of waste and inefficiency.

Addressing the key issues

Facilities that approach digital conversion as "just another piece of equipment" often experience failure. Those that succeed do so by diligently addressing the critical issues. Facilities that also plan effectively reap rewards of increased patient care, satisfied patients, happy and productive clinicians and staff, and a strong return on the technology investment.

The challenge of digital conversion lies in capitalizing on the benefits of the technology by balancing its capabilities with user needs and workflow. As equipment and information systems become more sophisticated, facilities face the challenge of blending these technologies so that patient, technologist, and physician needs are met – all while trying to achieve operational efficiencies and realize a return on investment. This is not an easy endeavor.

Each facility's imaging environment is unique, and requires an individual approach to realize immediate and lasting benefits from digital conversion.



Are you ready for the digital world?

Is your facility ready for conversion to digital mammography? You may need expert assistance if you answer “no” to any of the following questions:

1. Have you developed a strategy that addresses how to maintain a patient-centric environment while effectively handling high imaging volumes?
2. Do you have a plan on how to eliminate current underlying operational inefficiencies that may affect your success with digital conversion?
3. Have you determined an approach that will combine analog and digital workflows while maximizing user satisfaction?
4. Do you have a formal plan for eliminating workflow redundancies (such as paperwork) to increase throughput efficiencies while maintaining or enhancing communication between technologists and radiologists?
5. Do you know how you will implement various soft-copy interpretive approaches (image routing, historical comparisons, digitizing, network traffic, image archiving), and have you determined how they affect radiologist workflows, efficiencies and satisfaction?

Processes that work well in analog mammography cannot simply be transferred to a digital environment: Successful conversion requires strategic planning. That planning is complex. It takes time, and it often requires a team of professionals who understand how best to blend all critical aspects of the digital conversion – technology, process, and people.

Workflow efficiency

Workflow must be designed to move images and information smoothly to meet the needs of patients, technologists and radiologists alike. The ultimate goal is to avoid bottlenecks that compromise efficiency, and instead give patients timely access to imaging, with minimal wait times for appointments and minimal waiting during the imaging process itself.

- *Technologist workflow.* Technologists must be able to access historic images easily and quickly without tying up the imaging room. The workflow also must support timely and effective communication between technologists and radiologists. Breakdowns in communication ultimately mean that procedures are delayed, patient consultations are postponed, and procedure volume is less than optimal.

- *Radiologist workflow.* Digital mammography systems can generate considerably more studies per day than analog units – yet radiologists need the same amount of time, or more, to read the studies. Unless workflow is adjusted to meet radiologists’ needs, reading becomes a bottleneck. In particular, it must be as convenient as possible for radiologists to compare current digital and previous analog studies – whether the priors are on film or digitized.
- *Image and data workflow.* Electronic flow of images and data can greatly enhance technologist and radiologist productivity – but it requires an adequate network and storage infrastructure. The simultaneous transfer of multiple mammography datasets on an undersized network can cause long delays for radiologists in opening and reading studies. There are many possible IT configurations. The key is to balance the conception of an ideal clinical workflow against the realities of the network. If the network cannot support the ideal, then compromise will be necessary.

Physician, technologist, and patient satisfaction

The better the workflow, the more readily clinicians will embrace the technology, and the better patients will be served. Workflow must balance the technology’s capability and the users’ needs. Otherwise, efficiency will suffer greatly, and the facility will not realize the full benefits of digital mammography.

Some sites make the mistake of bringing in a digital machine, but keeping essentially analog practices – keeping the same time slots as before, or even printing out images on film. In such settings, technologists and radiologists become frustrated because they cannot be efficient in a workflow that does not complement the technology. Patients are subject to needless waiting. And revenue is lost because the technology is not used to its full capacity.

Operational efficiency

Numerous operational issues can erode the benefits of digital technology and compromise the ability to deliver patient-centric care. For example, some facilities that have electronic means of eliminating paper essential to the interpretive process continue to incorporate redundant paper-based processes in the digital environment.

Others accept less-than-optimal throughput in exam rooms without investigating the root causes. If the allotted imaging slots per day are consistently not being used yet there is a procedure backlog, then the cause is most likely an inadequate process.

System integration

In a perfect world, radiologists would sit at a single workstation, accessing information and using systems seamlessly. PACS, RIS, HIS, dictation/structured reporting would be fully and bi-directionally integrated. While the ideal environment is perhaps five to 10 years away, currently there is a need to compensate for disparities among the essential systems to make interpretation in the digital environment as efficient as possible. There are varying levels of integration but work-arounds can be created that further enhance convenience.

Applications training

In a complex transition to digital mammography, it is easy for users to shortchange or overlook the critical component of training. Inadequate training can significantly impact end user acceptance especially as software and technology become more sophisticated. Mammography technologist training is typically very straightforward, but for busy radiologists training can be a challenge. Radiologists who do not commit to dedicated training recommendations may compromise a solid understanding of software functionality. This in turn can create frustration and ultimately compromise their interpretive efficiencies.

Cases in point

Experience documents the tangible benefits of proper planning for digital conversion. Digital mammography conversion experts can substantially help facilities of any size and kind, from small, independent imaging centers to major academic hospitals.

Case 1: Improving procedures

A large academic hospital in the northeast United States converted to digital mammography as part of an effort to become a breast care center of excellence. Facility leaders, understanding the challenges of digital conversion and wanting radiologists to embrace the technology, called on digital mammography conversion experts.

The team found radiologists, residents and fellows working in a chaotic environment that compromised the ability to adhere to standard imaging and communication procedures. Radiologists and technologists were also involved in non-clinical tasks, such as hanging of prior films, filing and paperwork, that took away from their clinical responsibility.

The conversion team set up standard work procedures and created a workflow team of stakeholders to review any proposed changes. The team also recommended reassigning non-clinical tasks and suggested that radiologists meet not with every patient but only with those who had abnormal exams – about five percent of the population. Individual exam time was reduced by 35 percent, allowing the facility to increase the number of exams performed daily.

With these and other changes, the hospital reduced imaging process bottlenecks, increased equipment capacity by 29 percent, streamlined the imaging and communication processes, and freed up more staff time for patient care (13 percent more for radiologists, 47 percent more for technologists). Most importantly, radiologists were satisfied with the technology and readily accepted it.

Case 2: Leaving analog behind

A large breast center in the Midwest installed two new digital mammography systems, but did not redesign its workflow to complement the technology. Instead, the center kept the same exam time lengths that they had used in the analog environment.

Seeking to optimize patient throughput and revenue, the center called on digital conversion professionals, who recommended workflow changes that significantly shortened exam time slots.

Most importantly, the change enabled the center to perform an additional 10,000 procedures per year, generating approximately \$625,000 in diagnostic radiology revenue – plus \$1.1 million per year in additional downstream revenues for surgery and radiation therapy.

Getting advice

There are so many important considerations in a digital conversion process that the decisions can be overwhelming. By involving digital conversion professionals early in the process, the experts have the ability to make recommendations that align with facility critical success factors, such as determining the number of digital units to buy or whether the radiologists should read on a PACS mammography module versus a dedicated workstation. Facilities often realize shortly after equipment implementation that the “2 to 1” rule (replacing two analog units with one digital unit) may not allow enough capacity for the future. The conversion professionals can also provide guidance as to what workstation approach is the better option, depending on department/facility needs and radiologist workflows.

A sound, strategic approach is the key to a successful conversion from analog to digital mammography. Practical advice, delivered as early as possible in the decision process, can help healthcare providers put digital technology to work for the full benefit of their patients and for the greatest financial advantage.

For more information about conversion to digital mammography, contact the GE Healthcare Digital Mammography Conversion Expert Team at digitalconversion@ge.com.

About the authors

Donna Drew, RT (R), RDMS, MBA, is an IT Practice Consulting Manager for GE Healthcare Performance Solutions with more than 25 years of clinical and administrative experience as a healthcare professional. During her career, she worked as a technologist in various breast imaging settings and has managed and directed radiology departments. She now assists facilities challenged with the complexities of mammography digital conversion to achieve their desired operational efficiencies, while incorporating industry best practices to realize and sustain success. She has lectured on digital mammography as a guest speaker at American Healthcare Radiology Administrators (AHRA). Donna is a board certified radiographer and sonographer and holds an MBA from the University of Colorado.

Michael Hase, MBA, has worked for the past eight years with GE Healthcare Performance Solutions, assisting radiology departments with process improvement initiatives. He is experienced in numerous care settings, from small rural hospitals to diagnostic imaging companies to large academic institutions. As a Senior Manager with GE Performance Solutions, he is responsible for building operational and cycle-time benchmarks for radiology departments. This information allows hospital leaders to prioritize organizational efforts to achieve maximum benefits from improved quality of care and operational and financial performance. Michael holds an MBA from Marquette University in Wisconsin.

Marisa Prondzinski is currently a Marketing Program Manager within GE Healthcare's Diagnostic Imaging business. An engineer by education, Marisa began her career in Lean manufacturing, where she gained a solid technical foundation by implementing lean principles and improving quality standards. In that role, Marisa saw firsthand the impact of GE's innovative technology and chose to follow it through to the customer by assuming a marketing role. Within the marketing organization, she has held a variety of positions in areas ranging from services to specific modalities. In her current position, Marisa is responsible for cross-functional marketing integration and developing best practices for imaging departments to enhance efficiencies and further growth. Marisa holds a bachelor's degree in Industrial Engineering from the University of Wisconsin-Madison.

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