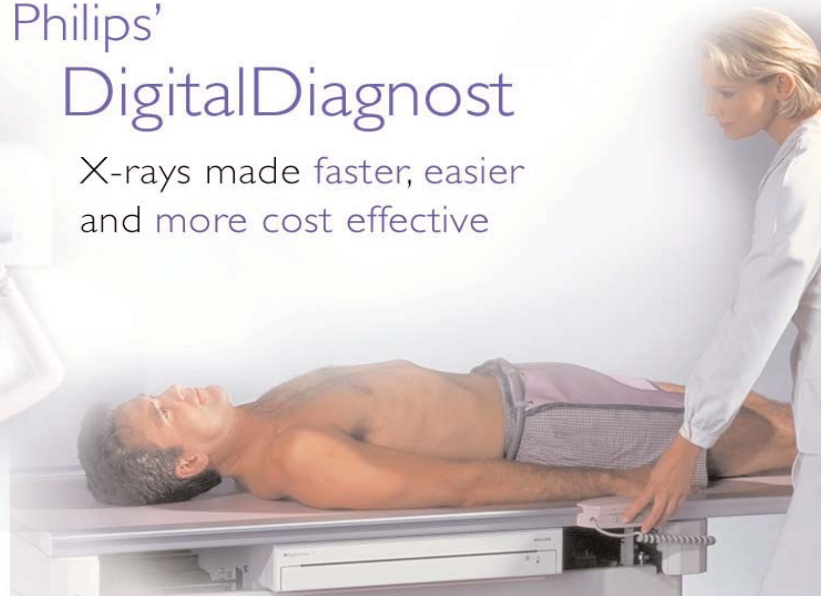




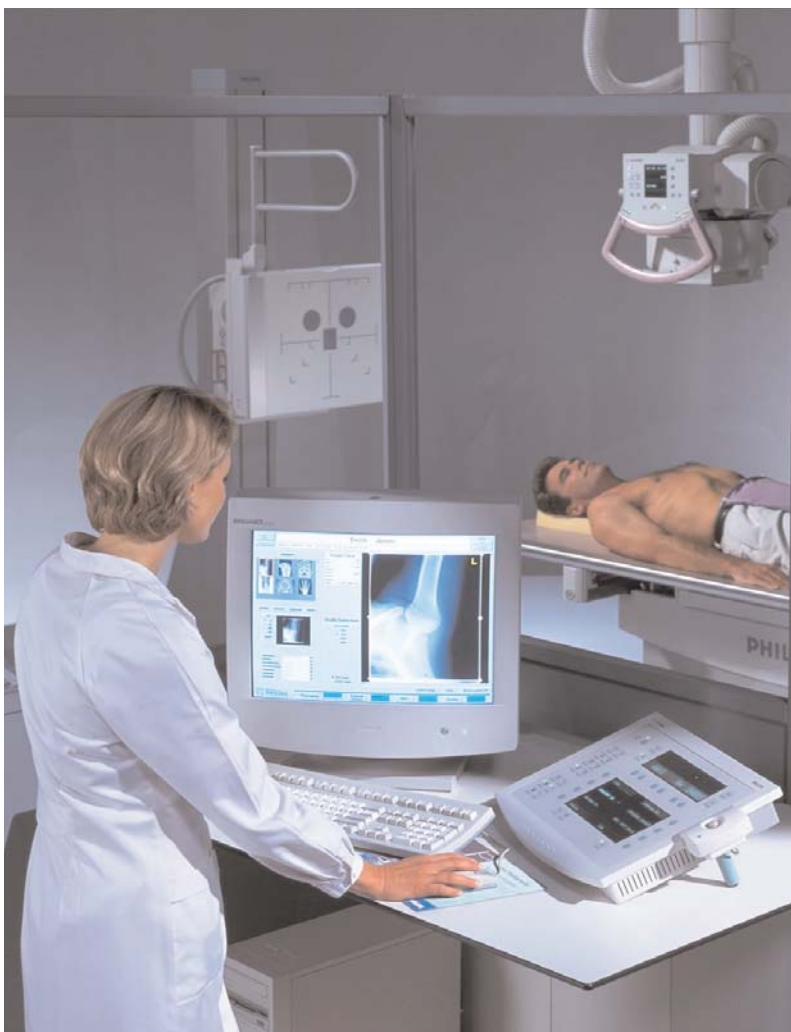
Philips' DigitalDiagnost

X-rays made faster, easier
and more cost effective



Sound Advice from
our website
www.medical.philips.com/us

PHILIPS



Philips DigitalDiagnost
Radiography System

“Our workflow has just astronomically improved. It's really unbelievable.”

- Barry Friedman,
Chief Radiology Technologist,
Mount Auburn Hospital, Cambridge, MA.

- The greatest square footage
- The greatest use of, and infrastructure for film”

Source: Frost & Sullivan, *World X-Ray and Computed Tomography Equipment Market*, 1999

Describing his frustration with the film-based process, Barry Friedman notes that, “for a typical house patient chest X-ray, you have to run your film, check it, maybe take another exposure, run it, check it, then stamp it and put it in an X-ray jacket – all while your patient remains unattended. It’s terribly unproductive.”

For short staffed departments, the time it takes to process, tag, handle and archive film-based X-rays has become a hindrance to diagnostic efficiency. And as the quality of digital imaging continues to improve in other modalities such as MR and CT, film-based general radiography falls short of the higher resolution and wider exposure latitude that is fast becoming a standard in the industry.

Any institution concerned about reducing costs, becoming more productive and more competitive, knows this paradigm must change. The question is – what are the alternatives?

The Solution

Philips Medical Systems provides two digital imaging options for general radiography- computed radiography (CR) and digital radiography (DR). Both options may be

The Changing Face of Radiography

The Challenge

In radiology today most imaging modalities are digital. MR, CT, PET, and ultrasound, all offer high-resolution digital images that can be shared and distributed widely. However the one modality that accounts for more than half of all basic imaging exams in many radiology departments, general radiography (X-ray), is still an inefficient film-based process.

“Radiography is both the biggest cost contributor and the most inefficient of applications in the department. More specifically, general radiography requires the following:

- The largest number of exams (60%)
- The maximum number of technologists



Philips AC5000 CR system

chosen as an upgrade to our basic BuckyDiagnost system and will allow you to manage and store large quantities of high-quality digital images. As part of a networked PACS you will also realize the benefits associated with DICOM compatible image distribution. Experienced Philips consultants can help you determine which solution is most appropriate for your situation.

The older of the two digital solutions, referred to as the "first step toward digital radiography," CR uses a digital cassette in place of the traditional film cassette. While more affordable than DR, CR still requires that the cassette be loaded into a reader for processing. Hence the length of time to complete an exam does not improve significantly over film – a crucial consideration when deciding on a digital radiography solution. DR on the other hand is a direct imaging technology that delivers a perfect digital image in one step – in a matter of seconds.

Why Is This Important?

Because it improves workflow dramatically.

A recent survey (commissioned by the American Hospital Association, the Federation of American Hospitals, the

National Association of Public Hospitals and Health Systems, and the Association of American Medical Colleges) shows that U.S. hospitals are facing a 15.3% vacancy rate for RTs (radiology technologists). And according to RSNA, radiology procedures are growing at an annual rate of 4.5%. So while the number of exams increase, staffing shortages continue to be a problem. Effective management of departmental resources becomes increasingly difficult.

A digital radiography system that significantly improves workflow is the best solution to this problem. Philips DR maximizes the general radiography experience with:

- Faster exams
- Lower patient dosage
- Consistent high quality digital imaging
- Ergonomic, user friendly equipment
- DICOM compatible files for networking distribution
- And top notch customer service

Our discussion here will focus on the real life benefits realized from the use of the Philips DigitalDiagnost – a state-of-the-art digital radiography system that can transform your conventional bucky room into an efficient part of your digital imaging family.



Philips DigitalDiagnost Radiography System

<i>Exam Time</i>	<i>Time with Film-based system</i>	<i>Time with DigitalDiagnost</i>
Lumbar spine, on an outpatient basis	20 to 40 minutes	8 to 12 minutes
Chest X-rays	7 to 10 minutes	2 minutes
Extremities, on an outpatient basis	10 to 12 minutes	2 minutes

“We have about 15 radiologists that rotate through this hospital. With our DR system, they now make a special effort to work here because the image quality is so good and it’s fast and easy for them to read and share the studies.”

-Gary Woodruff, Technology Manager, Novato Community Hospital and Marin General Hospital

Why Move to Digital?

Physicians, technologists and patients each benefit from a move to digital radiography.

- When the image is of a high, consistently good quality, radiologists can make a faster, more confident diagnosis. Now they can spend more time with their patients.
- Automated, easy to use equipment speeds each procedure, allowing technologists to perform them more quickly and efficiently. Now they can focus on the comfort of the patient.
- With shorter exams and reduced retakes, patients receive a smaller X-ray dose and spend less time in the exam room. Now they can quickly return to their busy schedules.

To demonstrate this, it is important to understand how the patient-friendly Philips DigitalDiagnost can dramatically impact your radiology department and help it keep up with growing volume demands.

Improve the Workflow

Gary Woodruff, Technology Manager at Novato Community Hospital and Marin General Hospital, in California recently studied the differences in exam times between a film-based system and the new Philips DigitalDiagnost. “The results were dramatic,” he said.

And these increases in productivity are often realized without an increase in staffing. “Two years ago our volume was 100 patients a day – between three rooms. Today it has increased to about 150 patients a day and we’ve added no FTEs (full time employees),” Gary says. “And our repeats

have gone from 6.5% to 0.5%. That’s a huge difference.”

At the Mount Auburn Hospital in Cambridge Massachusetts, Chief Radiology Technologist Barry Friedman concurs, “Our overnight tech says that what used to take her an hour – a multiple trauma from the emergency room – now takes her just 10 minutes.” He goes on to say, “Staffing issues have always been a problem. Although we’re down four FTEs I could probably get away with replacing only two of them and be happy – due to the efficiency of the DigitalDiagnost system.”

Philips Medical Systems has gone to great lengths to develop an ergonomic and intuitive digital radiography unit that streamlines exam time. The following functions are now handled by the DigitalDiagnost system on a largely automated basis:

- Updating of the worklist – with RIS connection
- Presetting of the generator and the collimator
- Automatic filter setting
- Anatomically specific image processing
- Application-driven region of interest detection
- Image annotation, e.g. kV, mAs
- DICOM export of images
- Printout on laser imager

Very few keystrokes are required. Most of the application control is handled automatically through the graphical user interface. Gary Woodruff describes the ease of use, “The tech will QC the image about six to seven seconds after the exposure. If they need to repeat it, they literally touch an icon on the monitor – modify the position of the patient (or adjust a setting) and re-shoot it. The repeat is done in only 30 seconds.” And anything that does not automatically adjust to the patient can be manually set by cordless remote control.



Image acquired using
standard x-ray film

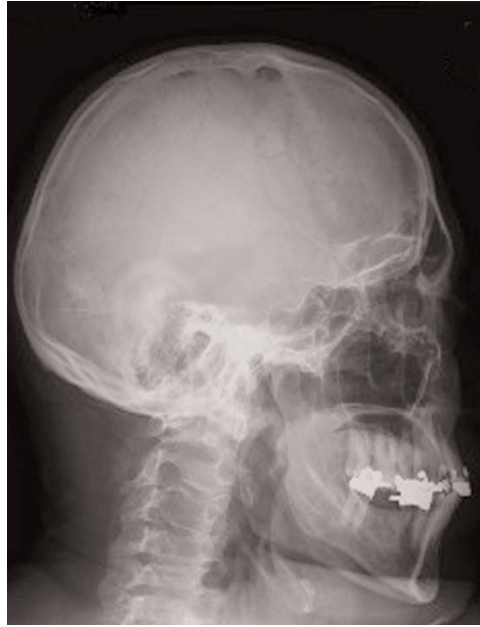


Image acquired with
Computed Radiography



Image acquired using
DigitalDiagnost

Increase the Image Quality

State-of-the-art detector technology and optimized image processing combine to offer you the very best digital imaging available on the market today. Three important factors contribute to this:

1. Detector size
2. Image resolution
3. Image processing

The Philips DigitalDiagnost's 43 cm x 43 cm (17 inch x 17 inch) flat panel detector – the largest on the market – is capable of full coverage of large patients. More traditional 41 cm x 41 cm panels are prone to clipping, and 35 cm x 43 cm panels must be rotated to perform transverse chest studies. "You always have the patient who you can't figure out whether to do a chest exam in portrait or landscape mode," says Barry Friedman. "With the DigitalDiagnost you don't have to think about it anymore." This "hands off" feature helps limit the technologist's need for interaction with the detector – adding to the speed of each exam.

The detector technology is based on the use of caesiumiodide (CsI) which provides excellent signal to noise ratio through a very high resolution matrix of 3,000 x 3,000 pixels. Such best-in-class performance allows fine detail imaging of bone structure and soft tissues thereby improving diagnostic confidence. And the wide sensitivity range reduces the need for retakes.

Improved detector technology calls for improved image processing techniques. Philips Medical Systems has been a leader in this area since 1985 when it introduced Unsharp Masking. Now, a new multi-resolution image processing software called UNIQUE is available for both CR and DR systems. It can bring out all the diagnostic details without an increase in artifacts. This "Harmonized Contrast" is possible because detail contrast is only improved where necessary so good detail is visible in all areas whether light or dark – independent of local density, brightness or latitude. UNIQUE is a robust image-processing software that automatically delivers the enhanced images you want without the need for user interaction. Thus, making it easy to use in any application.



Lower the Dose

Thanks to the digital detector's high sensitivity, quality images can be obtained at speeds of 800 to 1200 compared to 400 for conventional film. Fast speeds mean shorter exposure to X-rays and lower dosage to your patients. "Our Philips rooms are setup to run at 1200 speed, so we're giving patients a very low dose compared to CR and film - yet we still maintain excellent image quality," states Dean DeMaster, Radiology Manager at Mount Auburn Hospital.

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*- Dean DeMaster, Radiology Manager
Mount Auburn Hospital*



The design of the DigitalDiagnost reflects Philips Medical Systems' dose management philosophy, called DoseWise. "DoseWise is a set of techniques, programs and practices that ensures optimal image quality, while protecting people in X-ray environments." In addition to the highly sensitive detector, there are three main areas of this dose management strategy:

- **Smart Beam** - With Anatomically Programmed Radiography (APR) the energy spectrum of each examination's X-ray beam is adapted to achieve optimum image quality with minimum radiation. As soon as you select the type of examination, the automatic pre-filtration system clicks into place and blocks those x-rays that do not contribute to image quality. The result is up to 30% less patient skin exposure.
- **Less Time** - DoseWise' "First Time Right" philosophy ensures that an absolute minimum of retakes is needed. DoseWise also monitors exposure in real-time and can predict if the examination will produce a good image. If the beam is too weak, or not aimed at the detector, DoseWise will terminate the procedure within the first millisecond of exposure.
- **More Awareness** - The DigitalDiagnost system can come with an integrated Dose Area Product (DAP) calculation mode. By using the DAP calculator you will be given the relevant information you need for monitoring patient dose in an easy to interpret format.



Share & Review the Images

Digital imaging immediately improves the opportunity to share and review X-ray exam results with team members such as radiologists, surgeons, and referring physicians. The distribution advantages achieved through the use of a PACS such as the Philips Inturis for Radiology Suite and the compatibility provided by DICOM compliant file formats means that radiographic images can now enjoy the same sort of institution-wide integration as other digital modalities. Barry Friedman of Mount Auburn notices that the immediacy of digital image processing combined with the networking strength of PACS can produce dramatic results. "The X-ray image is seen in the ER and our main interpreting room, even before the patient is off the table. It's unbelievable."

Gary Woodruff and the team at Novato Community see an even more striking example of the benefits of networked consultation. "I monitored a case a few weeks ago where a patient was seen in the emergency room and digital X-rays were taken. At 2:30, the radiologist logged in remotely to review the case and 10 minutes later at 2:40, the referring orthopedist dialed in from his home to look at the images. Then at 3:30, the surgery crew was called in and they accessed the very same images on their monitors in the OR. The beauty of it was that within one hour the diagnosis was made and the patient was treated, yet two of the major players were not even onsite."

Philips Medical Systems' PACS rates number 1 in performance among customers, according to a report issued by research and consulting firm KLAS of Draper, UT.

The Philips Edge

Unique – Easy To Use – Features

When you consider the Philips DigitalDiagnost over the competition, several unique features stand out.

Conventional Room Design –

Rather than create a unique configuration (like a C-arm that can move in various directions), Philips maintains the standard bucky room design allowing easy upgradability from a film-based system to CR or DR. The detectors are in place – both upright and flat – in the same sort of traditional configuration that you would expect. This means a comfortable transition for your RTs and lower impact on orientation and training for the new system.

The technologists at Mount Auburn were impressed with this approach. "Our techs felt that the Philips BuckyDiagnost was one of the strongest radiographic rooms out there. They loved the design. It was very user friendly and it was field upgradeable to digital – very simple to do," says Dean DeMaster.



“The Philips DigitalDiagnost looks and acts just like a regular Bucky room, except that it's now a digital experience and exam times are a third of what they used to be.”

- Tim Stevener, Business Unit Director, Radiography, Philips Medical Systems



Automated Collimation/Generator Setup –

In addition to automatic collimation presetting, the generator is completely integrated into the DigitalDiagnost system and its operation is automatically controlled at the monitor – a feature unique to Philips. A single technologist need only select the APR (Anatomically Programmed Radiography) data set on the computer and the system does the rest.

Carla Jaeger, Clinical Education Training Specialist for Philips explains how easy it is to operate. “If you select a hand X-ray on the monitor, the system automatically sets up the detectors, the collimation and the specific exam technique.”

Customized/Automated Exams (APR) –

Carla and specialists like her at Philips visit new customer locations working closely with each physician to tailor image characteristics to suit particular preferences. “We start out with the default processing algorithms but after we take a few test images we go to the radiologist and say, ‘OK, tell us what you want. Do you want more contrast – less contrast, more detail – less detail? What is it you want to see?’” In this manner each type of exam is preset into the system with a customized data set and each and every time the technologist takes a

chest X-ray, the image quality is reflective of the personal preferences of the physician. There’s no more need for individual windowing and leveling.

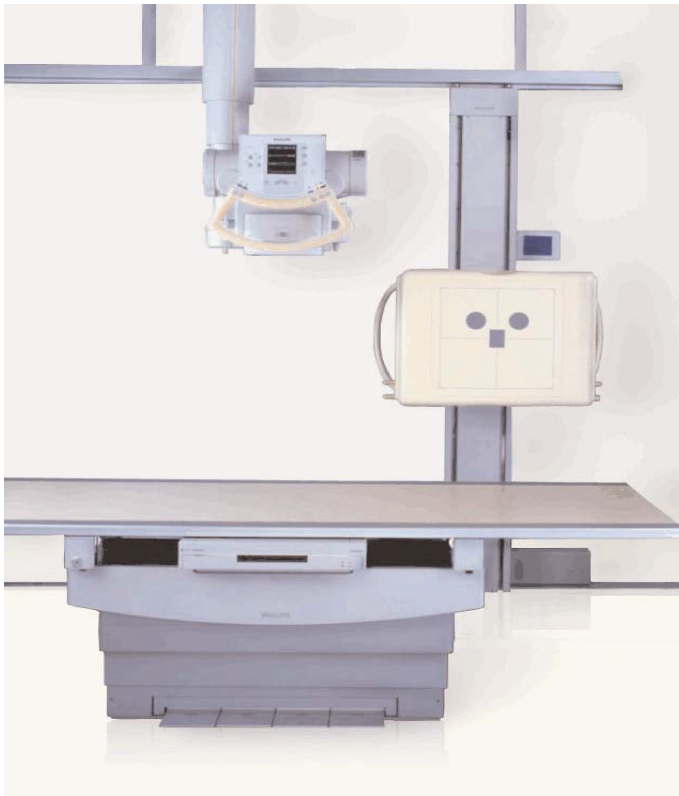
These automated exam types (APRs) are available immediately as the technologist brings up a new patient record in the RIS. The requested exam type is displayed on the monitor. There is no fumbling around to pick and choose an exam to select. And if more than one exam is requested, the system even tells you in what order they should be done!

“You click on your patients name and whatever was put into the HIS/RIS is what you see,” says Barry Friedman. “If a chest X-ray was ordered – you get a chest X-ray. The techniques are all set for you. Everything is ready to go.”

Remote Control for Wall Bucky –

When manual adjustments to the wall bucky are necessary, they can be accomplished through the use of a wireless infrared remote control. For example, the remote control can raise/lower the wall Bucky, control the collimator shutters, and toggle through lower/center/upper alignment of the detector. It even has a memory button.





Moveable Wall Stand

Moveable Wall Stand for Cross Table Laterals –

Another innovation that has truly transformed the Philips DigitalDiagnost into a full functioning digital radiography suite is the new “movable digital wallstand”. Those difficult cross table lateral exams (i.e. cervical spine, hip) no longer have to be done with the CR cassette. Now the digital wall stand and its great image quality can be brought tableside – away from the wall. Not only does this greatly expand the application flexibility of the system but it also provides for a shorter and more effective image management process.

Security in Investment

Upgrades Are Easy

Whether you are ready to move to digital today, or prefer a more modest move to computed radiography (CR), Philips Medical Systems is a common provider of both solutions. Our philosophy is to analyze the situation and identify the proper technology, based on workflow, timeframe, and dollars.

The upgrade path has been carefully thought through to make certain the move from film to CR to DR is as seamless and painless as possible. The processing technique for both CR and DR is exactly the same. And Philips builds its own user interface for both so there is a look of familiarity as you grow.

If you presently work with our BuckyDiagnost product, adding a CR cassette is easy, you need only make room for a single workstation. Then when you’re ready for DR, we simply replace the Bucky tray with a digital detector and (for a two detector system) add a digital radiography table.

Customer Satisfaction is Our Priority!

The work of specialists such as Carla Jaeger goes beyond the radiographic equipment itself. “We also customize the RIS system to the DigitalDiagnost so the RTs can perform worklists. We program the DigitalDiagnost to accept that worklist so there is no need to manually enter patient information.” Integration into your hospital’s HIS on the front end and PACS on the back is part of the exceptional service that Philips customers have come to expect.

Our award winning service support team and engineering staff is always available. Just last December 2002 Philips was ranked

Our DigitalDiagnost can also be purchased in a single detector configuration. The Philips DigitalDiagnost VR chest X-ray system offers all the benefits of digital imaging (by using a movable radiolucent table/ gurney) at a lower entry level cost point. Philips' economical approach to DR allows our customers much more flexibility than other alternatives.



“What separates us from the competition is our comprehensive radiographic solution - with cutting-edge CR and DR technology, a common image processing technique and a very easy upgrade path.”

- Deborah Imling, Marketing Manager, Business Unit Radiography, Philips Medical Systems NA.

#1 in the ServiceTrak Survey for Overall Service Performance. More than 200 hospitals determined that Philips provided industry best:

- Engineering competence and attitude
- Help desk troubleshooting effectiveness
- Emergency service
- Hardware and software reliability
- System Installation process
- and more

Philips service locations are more likely to be close to your facility than most other vendors. Our robust nationwide network means that you don't have to wait for experienced technicians to arrive from across the country.

In September of 2002, Philips was presented the Frost & Sullivan Market Engineering Award for Customer Service Leadership. This award is presented to the company who demonstrates the highest levels of excellence based on these criteria:

- Responsiveness to customer needs
- Monitoring and addressing customer feedback
- Time to market
- Providing promotional support
- Providing value-added technology and services

We are the complete source, the right source for digital general radiography.

Making the Decision

Considerations

In the past, adding staff and accommodating facility growth might have been possible, but today's workforce is limited, budgets are tight and new floor space carries a high premium. Yet all modalities in your radiology department are being asked to handle more volume. Digital radiography provides a shorter exam time and higher quality images – but not at the expense of patient care. In fact it improves it.

At Mount Auburn, patient comfort is paramount. “There are certain benefits that you cannot measure, like better patient care,” Barry Friedman points out. “In the old days you'd have to abandon your patient on the table and hope that they'd be OK while you go to the darkroom. Now you move just outside their range of view, press the button and seven seconds later you have an image. Then you're back at their side.”

And as the marketing aspect of healthcare services becomes more important, the use of a Philips DigitalDiagnost can provide a competitive point of distinction. Gary Woodruff of Novato Community sees this trend. “We have about 15 radiologists that rotate through this hospital. With our DR system, they now make a special effort to work here because the image quality is so good and it's fast and easy for them to read and share the studies.”

If your institution is looking to improve its bottom-line by better managing its current resources, improving workflow and shortening exam times, Philips can help. With the Philips DigitalDiagnost radiographic imaging system, you can move out of the archaic world of film-based radiography and establish a center of excellence within your professional and public communities.

Get More Info

Much more information on the Philips DigitalDiagnost can be found on our website at www.medical.philips.com, or you may call 1-800-722-7900 to speak with a sales representative. ■

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