

WINDOW

2006 No. 1

THE MAGAZINE FOR GE HEALTHCARE CUSTOMERS AND BUSINESS FRIENDS

INTERNATIONAL EDITION

Women's Health Re-imagined.

Predict

Genetic test assesses susceptibility to breast and ovarian cancer PAGE 4

Diagnose

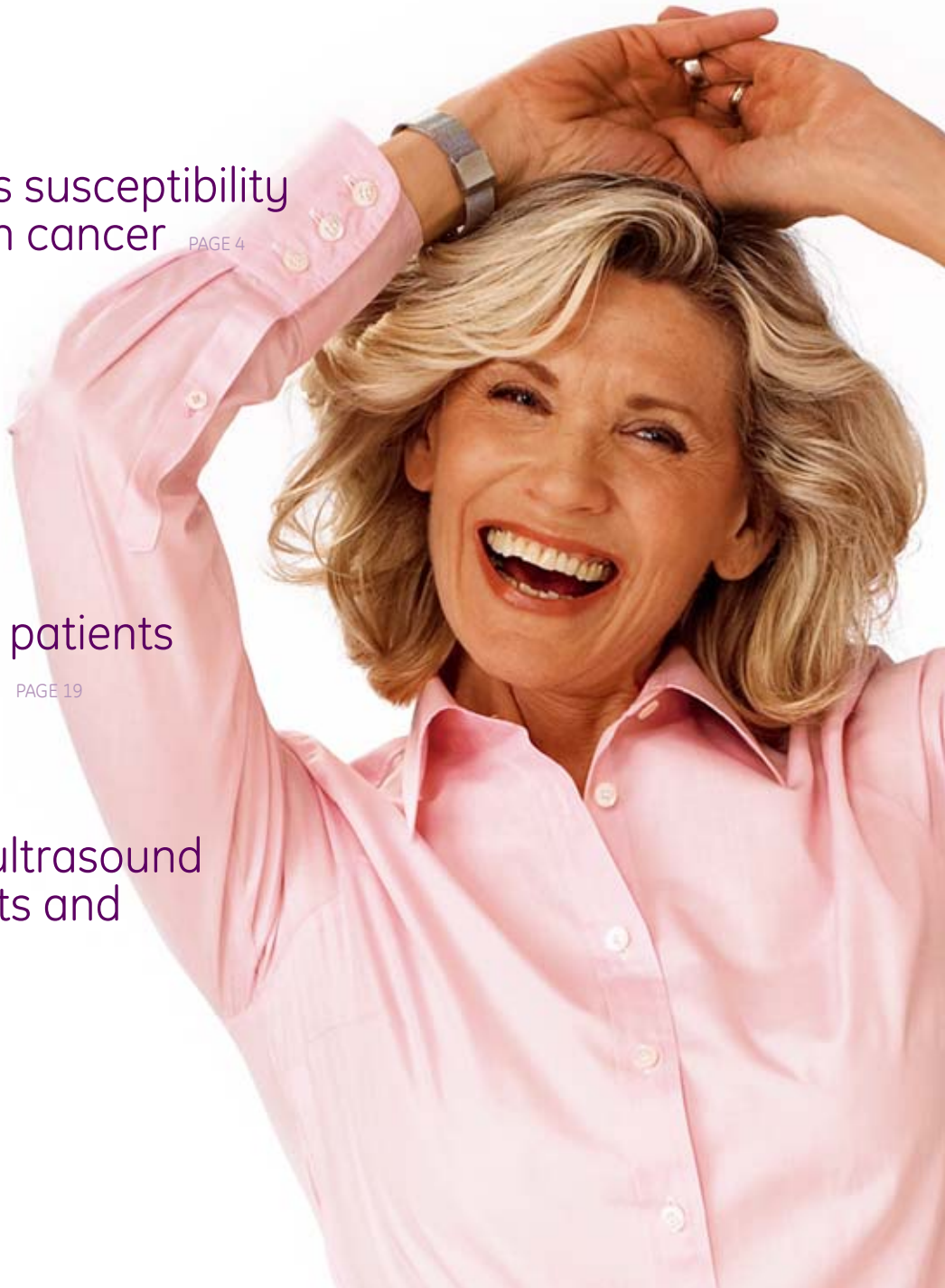
Enhanced diagnosis of osteoporosis PAGE 10

Inform

Mobile monitoring of patients in labor and delivery PAGE 19

Treat

MR-guided focused ultrasound attracts more patients and income PAGE 24



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About GE Healthcare

GE Healthcare provides transformational medical technologies and services that are shaping a new age of patient care. Our expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, performance improvement, drug discovery, and biopharmaceutical manufacturing technologies is helping clinicians around the world re-imagine new ways to predict, diagnose, inform and treat disease, so their patients can live their lives to the fullest. GE Healthcare's broad range of products and services enable healthcare providers to better diagnose and treat cancer, heart disease, neurological diseases, and other conditions earlier. Our vision for the future is to enable a new 'early health' model of care focused on earlier diagnosis, pre-symptomatic disease detection and disease prevention. Headquartered in the United Kingdom, GE Healthcare is a US\$15 billion unit of General Electric Company (NYSE: GE). Worldwide, GE Healthcare employs more than 43,000 people committed to serving healthcare professionals and their patients in more than 100 countries. For more information about GE Healthcare, visit our website at www.gehealthcare.com.

WINDOW

Editorial

Dear Reader

We are dedicating this issue of WINDOW magazine to women's health, reflecting our commitment to a more complete 'holistic' approach to healthcare and disease management for women.

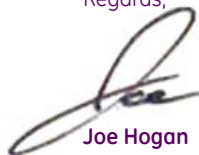
We describe this approach as driving early health to prevent 'late' disease. And by this we mean that our approach enables doctors to use the dynamic and innovative technologies we offer today to diagnose disease earlier than ever before and much more accurately in order to treat their patients more effectively in the critical time before a disease takes hold. Together, we are partnering with healthcare providers around the world to *Re-imagine Women's Healthcare* and build on our broad portfolio of innovations for women and children.

GE Healthcare is a unique company with world-class expertise in diagnostics, information technology and life sciences – as well as the rare ability to unite these areas to introduce technologies that will redefine the standard in women's healthcare. We recently launched a corporate-wide initiative on breast health focusing on helping doctors and their patients fight breast cancer. Read more about this and the range of sophisticated technologies we provide to fight this disease on pages 4, 8, and 16.

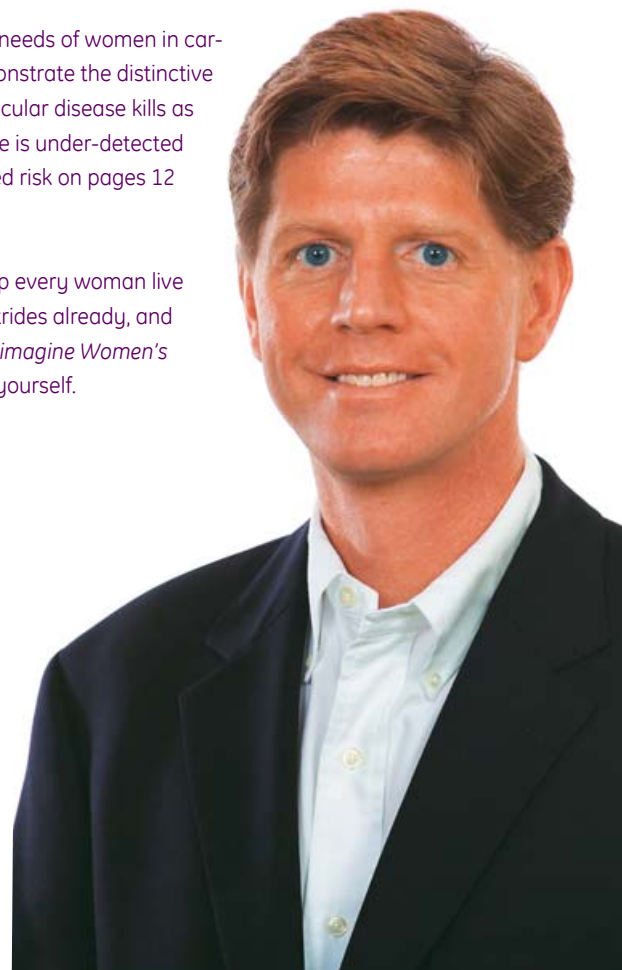
We are equally focused on serving the needs of women in cardiology. Research is continuing to demonstrate the distinctive needs of women in this area. Cardiovascular disease kills as many women as men, yet heart disease is under-detected in women. Read more on this overlooked risk on pages 12 and 14.

There is much more we can offer to help every woman live her life to the fullest. We've made big strides already, and there is so much more we will do to *Re-imagine Women's Healthcare*. Please jump in and see for yourself.

Regards,



Joe Hogan
President and CEO
GE Healthcare





A GENETIC TEST

assesses susceptibility to
breast and ovarian cancer

Myrriad Genetics, Inc., based in Salt Lake City, Utah, USA, is a biopharmaceutical company focused on the development of novel healthcare products. Myriad Genetics has developed, in collaboration with GE Healthcare's molecular diagnostics applications scientists, a genetic test which assesses susceptibility to breast and ovarian cancer using GE's **MegaBACE™** platform to sequence genetic variations.

The test, BRACAnalysis, assesses a woman's susceptibility to develop breast or ovarian cancer based on detection of mutations in the *BRCA1* and *BRCA2* genes. These alterations interfere with the normal production or activity of the gene, making the person more susceptible to breast and ovarian cancer. A woman with one of these gene mutations has a much higher risk of developing these cancers, a higher risk of cancer recurrence once it has been diagnosed and also may pass that gene mutation on to her children.

The test is done on a blood sample, overnighted to Myriad's certified laboratory. The two genes are separated from the rest of the DNA and are scanned for abnormalities.

The MegaBACE 1000 DNA Analysis System used in the test is a high-throughput, fluorescence-based DNA system utilizing capillary electrophoresis with up to 96 capillaries operating in parallel. The system performs sample injection, gel matrix replacement, DNA separation, detection and data analysis, offering unparalleled flexibility.

Towards prediction and prevention

According to the American Cancer Society, in the USA the average woman has an approximate 10% risk of developing breast cancer over a 70-year life span. However, in women with an abnormal *BRCA1* or *BRCA2* gene the risk of developing breast cancer by the age of 70 is up to 85%.

Women with *BRCA1* or *BRCA2* abnormalities also have an in-

creased risk of developing ovarian cancer. The lifetime risk in the general population is approximately 1%, but about 55% for women with *BRCA1* mutations and about 25% for women with *BRCA2* mutations.

The rapid genetic assay enables doctors to help patients determine their susceptibility to breast and ovarian cancer, enabling them to make more informed decisions about their options for early cancer detection and risk reduction.

"We are world leaders in cancer predictive medicine," says **Mark H. Skolnick**, PhD, Director and Chief Scientific Officer of Myriad Genetics. "Individuals with a history of cancer in their family use our products to determine their own risk of developing cancer. In the battle against cancer, being forewarned is truly being forearmed. Risk can be managed and cancer may be averted through appropriate precautions. If the disease is diagnosed early, it may be treated more successfully through a variety of proven options," Dr Skolnick explains.

"The best time to beat cancer is BEFORE YOU EVER GET IT"

Myrriad Genetics, Inc. is a leading biopharmaceutical company with a strategy to develop novel healthcare products in areas of critical need and to address some of the most pervasive diseases of our time.

Like GE Healthcare, Myriad Genetics Inc. is committed to personalized medical care. They believe the era of a more discreet use of medicines is upon us, one in which patients are screened in advance to receive a specific benefit before administration of a drug. Like GE Healthcare, they see an explosion in the growth of personalized medicine and intend to participate in that growth through the development and introduction of innovative products.

In addition to an expanding preclinical pipeline, the company's drug discovery and development is strong not only in cancer but also in the areas of Alzheimer's disease and antivirals.

Myriad Genetics also develops and markets predictive and personalized medicine products such as genetic tests for hereditary breast and ovarian cancer, hereditary melanoma, adenomatous polyposis syndromes, and hereditary non-polyposis colorectal cancer (HNPCC).

Mark H. Skolnick, PhD, Chief Scientific Officer and a Director of the company since 1991, is a scientific founder of the company. Dr Skolnick and several colleagues were the first to conceive of using restriction fragment length polymorphism technology as genetic markers, a breakthrough that underpins the Human Genome Project.



Fully integrated small animal imager for advanced quantitation and volume fusion: eXplore Vista PET/CT.

GE Healthcare's eXplore Vista PET/CT scanner is one of the first combination positron emission tomography and computed tomography (PET/CT) imaging solutions dedicated for small animals. With its breakthrough technology, academic and life science researchers can more precisely and confidently localize tumors, perform applications not possible with a stand-alone system, and greatly improve workflow and productivity.

DEDICATED COMBINATION PET/CT imaging solution for small animals

The instrument integrates the proven performance of GE's eXplore Vista PET with high-resolution CT. The integrated system achieves an unmatched combination of sensitivity, spatial resolution, and uniformity from Vista's unique depth-of-interaction detector and high-resolution CT with a streamlined workflow, resulting in quantitative accuracy and improved productivity.

"The ability to confidently detect, localize, measure, and quantify extremely small differences in radiotracer uptake in the same animal over time and across multiple animals in a repeatable and reproducible manner is an essential need that extends over many areas of pre-clinical research," says *Michael Britton*, general manager of Pre-Clinical Imaging at GE Healthcare. "The eXplore Vista PET/CT uniquely addresses this need by bringing together two modalities to provide comprehensive quantitative answers whereas each modality alone leaves unanswered questions."

Applications in oncology, neurology and cardiology

The eXplore Vista PET/CT realizes the full potential of combining functional and anatomical imaging without compromising image quality. The high-resolution CT image reconstruction produced acts as an anatomical map upon which the scanner superimposes the functional PET image.

This allows researchers to precisely quantitate and outline the boundary of a tumor or molecular target, facilitating oncology and neurology studies as well as histology procedures. The eXplore Vista PET/CT also offers new insight into coronary anatomy,

myocardial perfusion, ventricular function, and cardiac viability – making it a powerful non-invasive cardiac imaging solution.

Multiple benefits

The integrated PET/CT system offers researchers several benefits with regard to anatomical localization, attenuation correction, and workflow and productivity:

Anatomical localization. The CT image provides anatomical detail to localize PET information. The integrated systems minimize registration error due to animal positioning, movement, and shifting of internal organs.

Attenuation correction. The attenuation-corrected datasets provide more quantitative accuracy. The CT attenuation maps have higher information content and are more uniform.

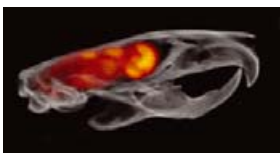
Workflow and productivity. Animal handling is reduced. The CT attenuation maps are acquired more than 10 times faster than transmission sources.

In addition, the system enables new applications with improved quantitation, such as PET/CT gating, more accurate tumor volume measurements, tumor therapy/response measures, and advanced parametric models.

The eXplore Vista PET/CT enables medical researchers to localize and quantify radiotracer uptake related to morphological structure in small animals more precisely than ever before. It can improve the amount of uncertainty or error in quantitative results by as much as 80% through minimized registration error, precise definition of anatomical structural boundaries and accurate corrections.

In addition to superior quantitative data, it enhances medical research with faster exam times and simpler animal handling compared with today's method of using single-modality or two separate systems.

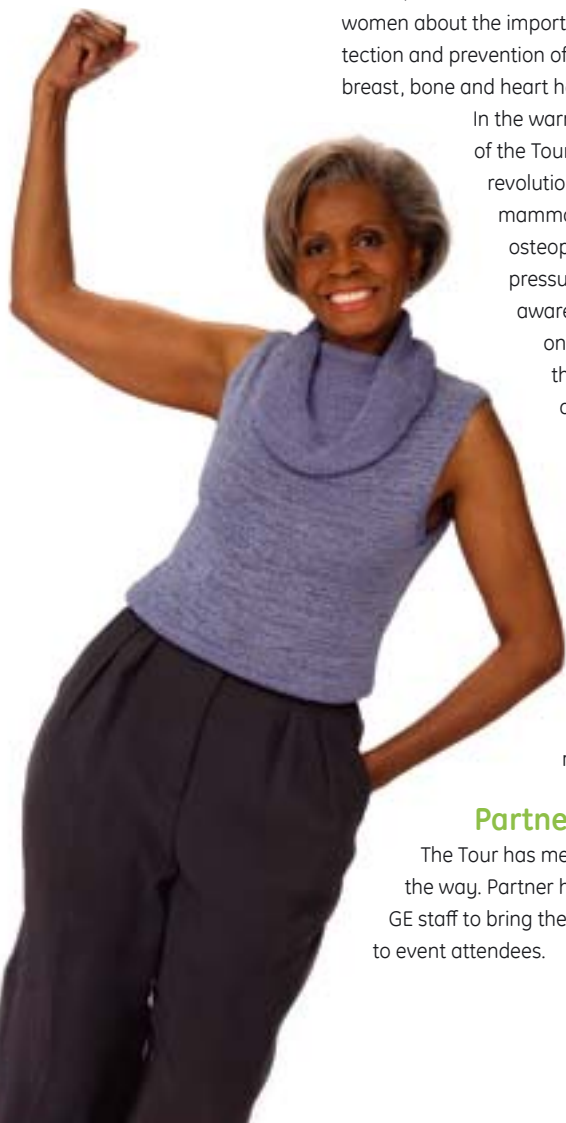
For more information, contact ge_preclinical@ge.com.



FDG (2-deoxy-2-[18F]fluoro-D-glucose) metabolic function in rat brain (courtesy Hospital General Universitario "Gregorio Marañón", UMCE, Madrid, Spain).

Taking women's healthcare ON THE ROAD for prevention

With over 80,000 miles covered and thousands of health screenings completed, the GE Women's Health & Wellness Tour has been taking the message of women's health to towns and cities across the United States. Housed in two custom-designed semi-trailers, the Tour is dedicated to educating women about the importance of early detection and prevention of various women's health issues, including breast, bone and heart health.



In the warm, friendly and interactive environment of the Tour vehicles, women can learn more about revolutionary medical technologies, such as digital mammography, and find out if they are at risk for osteoporosis. Women can also have their blood pressure and cholesterol checked, increasing their awareness of heart disease, which is the number one killer of not only men but also women in the USA, the European Union and many other developed regions. Questions are encouraged and women are urged to play a vital role in ensuring the health of their families and themselves.

In addition to health screenings in the Health vehicle, a demonstration kitchen in the Wellness vehicle can be used for lessons on healthy eating and healthy cooking techniques. Yoga and other exercise demonstrations teach new ways to integrate exercise into daily routines.

Partner hospitals pleased

The Tour has met with great enthusiasm at each stop along the way. Partner hospital staffers work side-by-side with the GE staff to bring the importance of proactive healthcare home to event attendees.

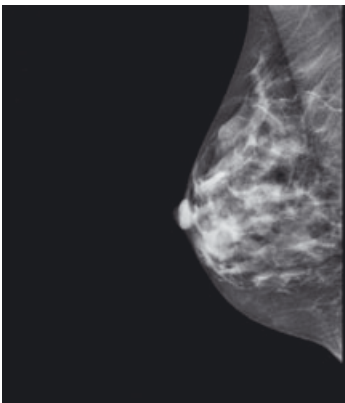
"The Wellness Tour helped community outreach and gave patients a preview of Centennial's new digital mammography system," says **Karen Giorgio**, Manager of Marketing and PR at Centennial Medical Center, in Nashville, Tennessee. "It showed we were getting ready to do something exciting, and it was a way of making women feel comfortable to come to us for their health concerns," she adds.

Women's healthcare is an important mission for GE Healthcare. "Access to the latest and most advanced diagnostic technology can make all the difference in terms of early detection, more accurate diagnosis and less aggressive treatment plan requirements for many diseases and conditions," says Joe Hogan, President and CEO of GE Healthcare. "The Tour provides us with a unique opportunity to give something back and really engage women in important and informative discussions that can positively impact their health today and in the future."

Breast cancer is the second leading cause of cancer deaths globally. More than 1.3 million people will be diagnosed this year alone, according to the World Health Organization. In Europe and North America, one in nine women will be diagnosed with breast cancer in their lifetime. GE Healthcare is addressing this challenge with a corporate-wide initiative to help women fight this deadly disease by providing a holistic view to breast health aiming at earlier diagnosis and more effective treatment.



A healthier outlook FOR BREAST CANCER

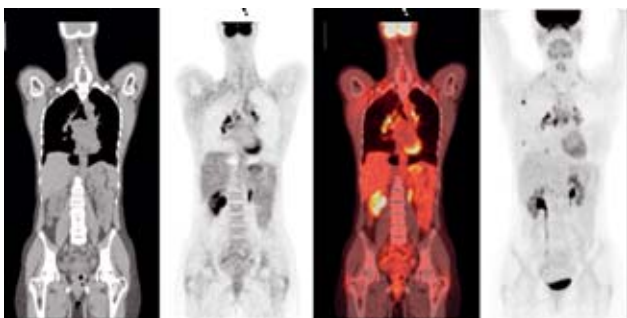


Full-field digital image with Premium View and Fine View

It all started with mammography

As the only breast imaging procedure approved for screening in the general population, mammography is used across breast care for diagnostic and follow-up exams, guiding biopsy procedures using stereotaxy, and for surgical planning and localization. Mammography is a critical part of early detection. **Professor Per Skaane** of the Breast Imaging Centre, Ullevaal University Hospital, Oslo, Norway, says, "Early detection of cancer offers the opportunity to treat cancers earlier in their development with less aggressive treatments. It can mean that the cancer is less likely to have spread to lymph nodes, and can make the difference between keeping and losing a breast."

A number of recent studies have been undertaken to assess various aspects of the clinical relationship between digital and film-screen mammography. Key among these are the Oslo II study (Radiology 2004; 232: 197-204) and the recently released American College of Radiology 'Diagnostic Performance of Digital versus Film Mammography for Breast-Cancer Screening' study (New England Journal of Medicine 2005; 353: 1773-83). One of the primary digital mammography systems used by participants in each of these studies was the GE Senographe, developed and manufactured by GE Healthcare.



PET/CT imaging facilitates treatment monitoring.

disease, the MR application VIBRANT™ provides the missing link in a comprehensive breast assessment.

New MR spectroscopy techniques are emerging that may further improve the specificity of breast MRI with such breakthrough applications as GE's MR BREASE, which is a new technique that improves specificity in breast

Folke Lindberg, Global Leader for Mammography at GE, says, "GE Healthcare developed the world's first digital mammography system. Conventional film-based detection is still a very powerful technique, but digital mammography offers many advantages to women and clinicians. These include fewer recalls due to technical failures; quicker, more patient-centered examinations; and the ability of clinicians to share and review images remotely, which offers the promise of greater efficiency." He adds, "Digital mammography, by the very nature of its digital format, has the potential to allow even more advanced applications such as 3D breast imaging and image fusion at some point in the future."

An impressive list of leading-edge technologies

Breast imaging is one of the fastest growing applications of ultrasound, which is the primary modality for image-guided biopsy procedures. With ultrasound, clinicians can easily align the needle position to biopsy breast lesions in real time with greater precision and speed. GE is delivering a new era of ultrasound technology called volume ultrasound by combining the industry's most advanced system platforms, LOGIQ® and Voluson®, along with multi-dimensional image applications and new 4D and Matrix array technologies. Volume ultrasound will allow physicians to explore patient images in any plane, reveal the smallest details and acquire and construct volumetric images in real time with stunning clarity.

With its high sensitivity, magnetic resonance (MR) is another rapidly growing modality in breast imaging. It is being used as an imaging tool for high-risk patients, and as a problem-solving tool for patients with dense breasts and indeterminate mammograms. Given that one in three breast cancer patients has undiagnosed multi-focal

imaging and allows physicians to look at the chemical makeup with breast spectroscopy. MR BREASE shows physicians elevated concentrations of choline, a product of membrane synthesis that rises in rapidly reproducing cancer cells. Robert Lenkinski, PhD, head of MRI research at Beth Israel Deaconess Medical Center in Boston, Massachusetts, USA, explains, "Spectroscopy adds another measure to improve the overall accuracy of MR scanning of the breast."

GE's MR BREASE is a new enhancement to the company's VIBRANT (volume imaging for breast assessment), a high-definition technology that enables a non-invasive imaging procedure of both breasts simultaneously, in a single patient visit. VIBRANT-XV further expands the capability to acquire high-resolution images at high speed, providing both exquisite anatomical detail as well as critical kinetic information. GE has more than 400 VIBRANT installations worldwide.

GE Healthcare also offers a number of advanced imaging technologies to assist in treatment planning, monitoring and follow-up for cancer. GE pioneered the concept of PET/CT imaging. The Discovery™ family of PET/CT systems – the world's leading PET/CT scanners – combines functional and anatomic information in one exam, providing excellent co-registered images for tumor staging and radiation treatment planning. PET/CT also demonstrates high specificity in monitoring treatment, helping physicians assess the efficacy of therapy.

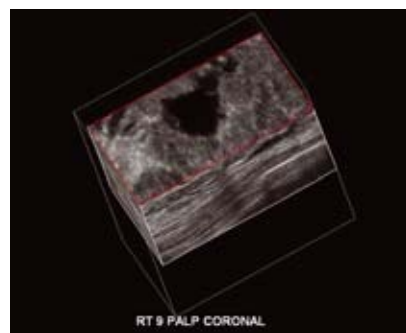
Leader in breast care

GE has been a leader in the fight against breast cancer since the 1960s. The company has pioneered several major advancements including the world's first full-field digital mammography (FFDM) system, 4D volume ultrasound and MR bilateral breast imaging.

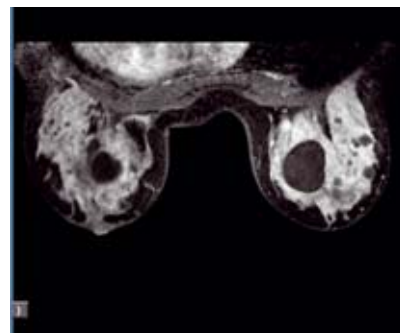
It is estimated that more than 20 million women and breast cancer patients are touched by GE Healthcare technologies, based on the number of systems installed and products used around the world.

"We're taking a holistic, multi-modality approach to breast cancer by looking at all of GE's capabilities and how they will impact the whole spectrum of the disease, from screening and early diagnosis through treatment," says April Dorcas, strategic marketing manager for Women's Healthcare at GE Healthcare. "In working together with global luminaries in this field, we are committed to delivering significant clinical and productivity value for clinicians and patients."

Ultrasound 3D coronal view of breast cyst featuring Raw Data



MR VIBRANT bilateral breast imaging





GE introduces new **bone density system** to enhance diagnosis of **OSTEOPOROSIS**

Osteoporosis is a silent, progressive disease characterized by decreased bone density and increased bone fragility, with a consequent susceptibility to fracture. It may progress silently for decades – there may be no symptoms until fractures occur.

Bone loss can be modified in mid-life to reduce fracture risk by treatment, but it is difficult to restore the microarchitecture of the skeleton once bone has been lost. Therefore early detection and intervention are crucial.

Women are at the greatest risk for osteoporosis. The worldwide lifetime risk for a woman to have an osteoporotic fracture is 30-40%. One-third of Caucasian women over the age of 50 years have osteoporosis, yet nearly 80% of those women remain undiagnosed. There are also some misconceptions about osteoporosis, for example that it's 'an old woman's disease'. Although the majority of women with osteoporosis are post-menopausal, bone loss can occur in young adults as well.

Bone densitometry for osteoporosis management

Bone densitometry is an essential tool in osteoporosis management. Densitometry assists physicians in diagnosis, fracture risk assessment, and monitoring response to therapy.

Physicians utilize bone densitometry to categorize patients as normal, osteopenic or osteoporotic, following the World Health Organization (WHO) classifications. The patient's T-score (comparison to the young adult reference) is the critical variable in diagnosis. Typically, both femurs and the spine are assessed, with the diagnosis made using the lowest T-score. Patient examination, in addition to the T-score, is key to diagnosing osteoporosis.

Bone mineral density (BMD) is the strongest indication of fracture risk, which increases exponentially as BMD decreases. Femur BMD is

recognized as the strongest predictor of femur fracture risk, which has the highest morbidity, mortality and cost of all osteoporotic fractures. A decrease of one T-score (one standard deviation or SD) in femur BMD corresponds to approximately a three-time increase in femur fracture risk. In comparison, a decrease of one SD in spine BMD corresponds to a two-time increase in spine fracture risk.

Physicians may assess bone density every 1–3 years in their patients, depending on the expected rate of loss and their clinical situation. BMD may increase over time as a response to therapy, or it may decrease with disease progression or poor response to therapy. Precision (reproducibility) of the BMD measurements is the key factor in detecting changes in patient's BMD over time.

BMD re-imagined: Lunar iDXA

GE Healthcare is the proud manufacturer of the industry-leading densitometer, the **Lunar Prodigy™**. As part of the tradition and dedication to providing the world's most imaginative and most productive technologies to help physicians assess and diagnose osteoporosis GE has recently launched its latest breakthrough, the **Lunar iDXA™**.

The Lunar iDXA offers excellent precision and accuracy, high-resolution images, and advanced applications to increase clinical confidence and productivity.

Tomorrow's technology today

The 'brains' behind iDXA is the innovative CZT-HD™ detector with a staggered array design that yields high-resolution images. This high-definition technology provides near-radiographic image quality, allowing the clinician to see image details more clearly than ever before. The newly patented direct-to-digital CZT design originally earned its reputation for precision in the Lunar Prodigy series densitometers.

In addition, GE's Performa™ X-ray tube is the basis of the iDXA's unique integrated X-ray generation system, designed from the ground up to provide superior reliability and deliver the ultra-stable output needed for high precision, image clarity and worry-free performance.

iDXA precision equals or betters the industry-leading Lunar Prodigy series, allowing the clinician and researcher to detect real change in BMD up to twice as fast, and with greater confidence than competing densitometers. In addition, iDXA's accuracy is insured with its unique multi-point BMD and soft-tissue calibration, which automatically corrects magnification errors while setting a new standard for image resolution in a densitometer.

High-resolution images increase clinical confidence

iDXA delivers crisp, high-resolution images of all skeletal sites, revealing detail never seen before. It improves definition of end plates on spine images for easy identification of intervertebral spaces. You can see proximal femur details such as the femoral head, visualize cortical thickness, and see unprecedented total body images.

Michael R. McClung, MD, a bone clinician and researcher and founding director of the Oregon Osteoporosis Center in Portland, Oregon, USA, comments on how the Lunar iDXA has provided his team with image resolution enhancements for increased clinical confidence.

"The big advance with the iDXA is the improved image resolution. By having clearer pictures of the skeleton, technologists can be more



accurate in placement of regions of interest during scan analysis. This is important in the accuracy of diagnosis and for comparison with previous tests," he says.

"Secondly, with the remarkable image resolution it provides compared to other DXA systems, the iDXA will be very helpful in using VFA (vertebral fracture assessment) to diagnose spine fractures.

"Finally, our experience has demonstrated that the BMD results obtained with the iDXA are virtually identical to those measured with GE's current DXA technology. This will allow bone density centers to upgrade from other Lunar densitometers to take advantage of the improved image resolution without having to re-calibrate or re-calculate their bone density results," Dr McClung concludes.

The iDXA's dual-energy vertebral assessment for VFA provides rapid, dual-energy images of the anterior-posterior and lateral spine, to identify the presence of vertebral fractures. No matter what your visualization preference, single-energy or dual-energy, iDXA gives you the clearest, quality VFA image available. This enables you to visually assess vertebral deformities in detail, including the thoracic vertebrae that may be difficult to assess with other techniques.

Assess total body and body composition

Historically, DXA has assessed only bone – just one part of the overall body wellness picture. iDXA, however, takes a three-point assessment – bone, fat, and lean tissue – for a comprehensive view of the body in a single exam. This allows a clinician to analyze body composition, including fat percentage and distribution, for expanded clinical and research applications.

These include weight management, sports medicine, fitness programs, eating disorders and wasting diseases such as HIV or cancer. Furthermore, the Lunar iDXA's BMD and soft-tissue assessments can provide physicians with valuable clinical information for growth disorders, metabolic diseases and eating disorders, among other conditions.

Improving sensitivity for detecting acute myocardial infarction:

A CRITICAL WOMEN'S HEALTH ISSUE

The clinical problem

More than 7% of patients presenting with chest pain to emergency departments are diagnosed with acute myocardial infarction (MI) and are treated accordingly. However, studies have also shown that about 5% of these patients with acute MI are sent home.

Significant gender differences have been documented in both this miss rate and in treating acute MI. Women are more likely than men to be incorrectly diagnosed; in fact, approximately 58% of these missed diagnoses involve women (1).

More disturbing still, the mortality rate associated with these misses is 11% or more (2), and women are more likely than men to die from such incidents whether or not they are hospitalized (3-4). This is particularly true for women under the age of 65, who experience higher short-term mortality than men; the younger the woman, the higher the risk of death (4). The two-year mortality rate after hospital discharge may be as high as 30% for women and 20% for men (5).

Given the fact that more women die annually from heart disease than from stroke, lung cancer and breast cancer combined, these missed diagnoses represent a critical public health problem.

Why the diagnosis may be missed

The early symptoms of acute MI may differ significantly enough between genders to make recognizing acute MI in women difficult. Women's heart attack symptoms can be very different from those that men experience – including abdominal pain, shortness of breath, nausea and



fatigue (1, 6). According to a Gallup report, 88% of primary care doctors surveyed did not know that the symptoms can differ so substantially, and 33% failed to recognize heart attack as women's biggest killer (7).

In addition, women and men have different clinical profiles, which cannot be entirely explained by differences in baseline characteristics, and may reflect pathophysiological and anatomical differences between the genders (3). This is especially true for younger women. For example, in premenopausal women who die suddenly, plaque erosions are the predominant abnormality; in men and in older women, plaque ruptures are more common (8). Younger women also exhibit less arterial narrowing, which may mean that different clotting mechanisms are at work in this population (4).

Even when the diagnosis of acute MI is suspected, it is sometimes missed after routine testing, including ECG analysis. This suggests that perhaps today's ECG criteria may be wrong with respect to women (9).

Gender-specific 12SL ECG analysis program

GE Healthcare has developed a new algorithm for the gold-standard validated **Marquette® 12-lead ECG analysis** (12SL®) program to help physicians detect acute MI in women. This gender-specific algorithm applies new criteria for evaluating the ST segment and T-wave of the ECG waveform.

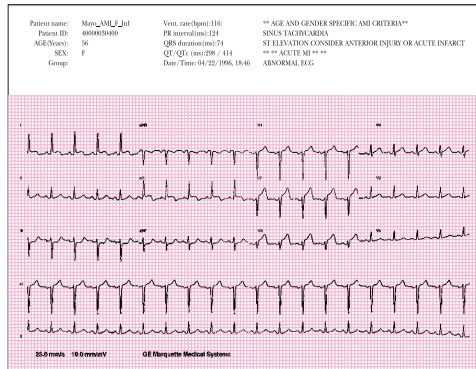
The result is an easy-to-use, computerized tool that can enhance diagnostic confidence among even occasional readers of ECGs, while improving the productivity of expert interpreters. By providing clinicians with a consistent and repeatable 'second opinion', this gender-specific program should help physicians to avoid overlooking subtle indications of acute MI, and therefore help to improve both patient outcomes and risk management alike. Age-specific and gender-specific 12SL analysis is now supported by a large variety of GE Healthcare's bedside monitors and diagnostic devices.

The gender-based ECG study

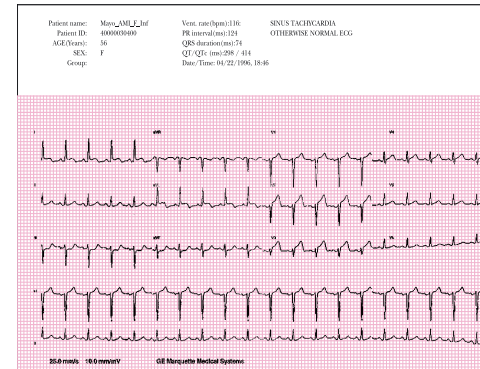
Researchers at the Mayo Clinic and the Medical College of Wisconsin analyzed

digital ECGs to determine whether there indeed were gender-specific differences in the ECG waveforms of acute anterior MI patients. They studied admission ECGs from 1159 MI patients with 207 age-matched controls. The study revealed that women have significantly lower ST elevation than men, independent of age (9).

To assess the effect of these differences on computerized interpretation, these researchers used GE's 12SL program, which takes into account such differences as lower ST-segment elevation, T-wave morphology and reciprocal lead depression. As a result, the researchers were able to show a relative 14% increase in sensitivity for detecting acute anterior MI in this population (9).



With gender-specific 12SL



Without gender-specific 12SL

Using the gender-specific 12SL ECG analysis software, the researchers demonstrated a 14% increase in sensitivity for detecting acute anterior MI in women.

Conclusions

The Mayo Clinic and Medical College of Wisconsin researchers in this gender-based ECG study concluded that, among patients suffering acute anterior MI, women have lower ST elevations than men regardless of age. It is possible that women with acute MI may experience worse hospital outcomes and receive less aggressive therapies in part due to these electrocardiographic differences – differences which may mask a subset of women whose ECGs fail to meet traditional criteria for reperfusion therapy (9).

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Cardiovascular disease (CVD) is the primary cause of death in European women, killing a higher percentage of women (50%) even than men (40%) and more than all cancers combined. However, there still exists a disturbing gap in the knowledge, understanding and general awareness of CVD in women.

CVD: a wake-up call for women

The misconception that CVD is a male disease is rife across the world. In fact, in Europe, the USA and many other developed regions, cardiovascular disease, CVD is the main cause of death for both men and women. And yet, according to public awareness surveys, women seem to think that they are more at risk of cancer, especially breast cancer. However, the under-estimation of the impact of CVD in women is not confined to the public. The medical professions also need to improve the screening, diagnosis, treatment and follow-up of women with CVD and its underlying risk factors.

Risk factors

Risk factors for CVD include a family history of premature heart disease, diabetes, overweight or obesity, smoking, high blood pressure, and cholesterol abnormalities. Other risk factors are hyperlipidemia and high blood pressure.

There are also important risk factors that are *specific to women*. Post-menopausal women who are more than 55 years old have a significant increase in CVD. The use of oral contraception and the presence of the risk factors listed above further increase the risk in women.

Gender differences

Women's symptom profiles often differ from those of men. Women with heart disease are up to ten years older than men. In fact, women tend to get heart disease later than men due to the cardio-protective effects of estrogen that play an important role up until menopause. However, after menopause, the risks increase significantly and need to be sensitively managed.

Moreover, women with heart disease present with much less obvious and stereotypical symptoms. In many women, the onset of heart disease is more gradual, accompanied by tiredness rather than the more commonly recognized symptoms, such as sudden violent chest pain, that predominate in men. Furthermore, women with CVD are more likely to die or suffer disability from a further attack or from heart failure.



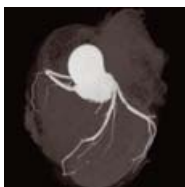
This article was written in collaboration with Dr Marie-Claude Morice, Institut Cardiovasculaire Paris Sud, Institut Hospitalier Jacques Cartier, Massy, France.



Diagnostic challenges

Women with coronary artery disease (CAD) often exhibit atypical symptoms, making it more difficult for them and their physicians to recognize and diagnose it. Some diagnostic tests can be less accurate for women than for men.

Cardiac computed tomography (CT) could be a good indication for patients with atypical symptoms. This is a convenient and non-invasive way of evaluating CVDs, and is a real alternative to invasive exams such as angiography. GE's volume CT scanner **LightSpeed VCT** offers exceptional image quality, providing lumen and wall details and a more accurate diagnosis. Moreover, the 5-second acquisition time increases patient comfort and convenience.



Indications for cardiac CT

The main indications for a cardiac CT exam are stent and by-pass follow-up, CAD detection and pre-surgery control.

Another promising area for cardiac CT is the triple rule-out. When a patient presents to the ER with chest pain a cardiac scan can be used to quickly evaluate for aortic dissection, pulmonary embolism and coronary disease.

Cardiac CT is hitting its stride, promising to improve patient care by providing high-quality, non-invasive diagnostic information for a significant proportion of cardiac patients. With the LightSpeed VCT, radiologists and cardiologists may be able to detect and treat CAD



70-year-old female with a plaque on the circumflex artery scanned using LightSpeed VCT (courtesy Imagerie médicale du Bois de Verrières, Antony, France).

before a cardiac event occurs and may improve the patient's preparation for surgery by providing accurate pre-surgical information for stent planning and bypass grafts.

Research has shown that women with CAD often present later to their doctors than men do (O'Donnell S, Condell S, Begley C, Fitzgerald T. Prehospital care pathway delays: gender and myocardial infarction. *Journal of Advanced Nursing* 2006;53:268-276), and they may have fewer cardiac procedures performed on them. It is critical to inform women of their risks and improve prevention. The LightSpeed VCT provides earlier detection of CVD and seems to be a solution for the diagnosis of female patients, who often present atypical symptoms.

When it comes to full-field digital mammography systems, WHAT'S TRULY ESSENTIAL?



Excellence in full-field digital mammography (FFDM) becomes a process, an ongoing quest, fueled by our continuing breakthroughs in breast cancer detection technology. GE Healthcare is committed to this quest – and inspired by the process of both refining and redefining what's essential.

GE Healthcare is launching a new digital mammography system, **Senographe Essential**, which comes even closer to the essence of what's possible in the early detection and fight against breast cancer. The Senographe Essential is ready. It's the platform for now and for the future.

The Senographe Essential provides outstanding image quality particularly on breasts with imaging challenges, such as dense or treated breasts. With the combination of automatic optimization of parameters (AOP) and rhodium, it also allows up to 50% less dose than with film. Its enlarged detector (24 x 31cm) accommodates large breasts with no degradation of small breast imaging.

Intuitive and equipped with fully automatic functions, the Senographe Essential is targeted for digital mammography. Silent, smooth, and ergonomically rounded, Senographe Essential offers flexibility and complete ease of use that will instill confidence into patient and technologist alike.

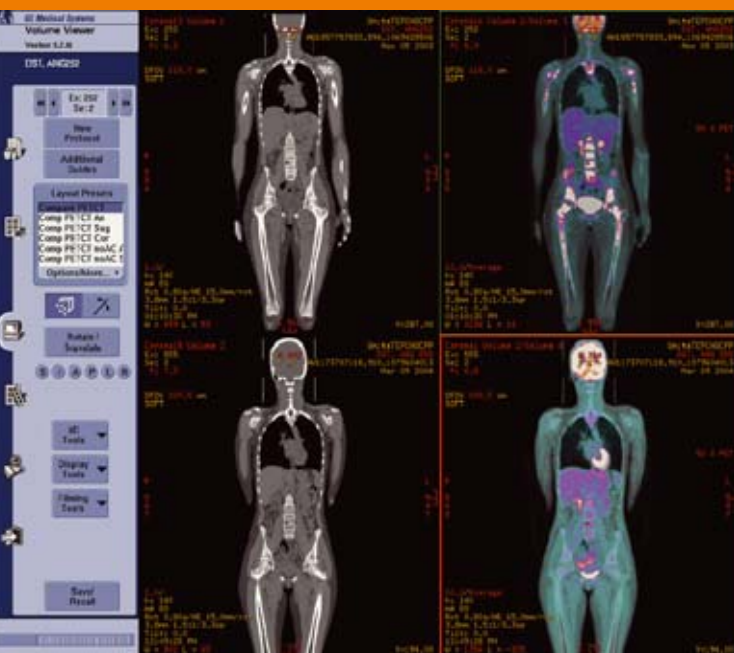
Enhanced diagnostic confidence plus optimal productivity – the Senographe Advantage 2 Review Workstation delivers the best of both. It builds on the swiftness and the power and functionality of GE's industry-leading Advantage Workstation (AW) platform, for fast interactive access and streamlined workflow.

Senographe Essential: because early detection is essential in a woman's life!

TOWARDS EARLY PREDICTION IN BREAST CANCER TREATMENT

Positron emission tomography/computed tomography (PET/CT) is a very useful tool for initial breast cancer staging, especially for locally advanced forms and suspected recurrences. It can also be used to characterize morphological changes, by differentiating between benign and malignant lesions and also between viable cells and areas of necrosis and/or fibrosis induced by treatment. There are now many examples available of important changes in individual patient management due to this hybrid technology, not to mention its growing importance in treatment volume determination within radiotherapy planning.

PET/CT in chemotherapy follow-up. The upper images show the patient prior to treatment and the lower images after treatment.



The role of PET/CT in therapeutic monitoring is also expanding rapidly due to its ability to provide earlier and more robust identification of non-responders than those provided by conventional non-invasive imaging approaches. First results using PET/CT imaging in the follow-up of breast cancer patients have demonstrated increased specificity compared with (18F-fluorodeoxyglucose (18F-FDG) PET alone (1).

PET/CT in the follow-up of chemotherapy

Chemotherapy is currently the treatment of choice for patients with high-risk metastatic breast cancer. Clinical treatment response is determined after several cycles of chemotherapy by changes in tumor size as assessed by conventional imaging procedures including CT, magnetic resonance imaging (MRI), plain film radiography, or ultrasound.

A recent study from the University Hospital of Hamburg-Eppendorf (2) concluded that in patients with metastatic breast cancer, sequential 18F-FDG PET allowed prediction of response to treatment after one cycle of chemotherapy. The treatment efficacy using PET

Personalized breast cancer management introduced in the USA

ACCORDING TO THE AMERICAN CANCER SOCIETY (ACS), ONE IN SEVEN AMERICAN WOMEN WILL SUFFER FROM BREAST CANCER DURING HER LIFETIME. IN 2004, 217,000 AMERICAN WOMEN WERE DIAGNOSED WITH BREAST CANCER AND 40,500 DIED FROM THIS DISEASE. BREAST CANCER IS THE LEADING CAUSE OF DEATH IN WOMEN BETWEEN THE AGES OF 45 AND 55 YEARS, AND IS BOTH THE MOST COMMON AND THE MOST FEARED FEMALE CANCER IN THE USA.

Until now, the management of breast cancer has focused on late disease management and the disease population as a whole rather than on early health management, i.e. risk assessment and stratification, screening and early intervention for individual patients. As a result, despite gains made in outcomes of breast cancer management over the past several decades, significant clinical and operational needs remain. These include the current one-size-fits-all screening protocol, which does not address risk variance in the women population, and long operational delays in getting patients screened, diagnosed and treated.

GE's PBCM program

GE Healthcare's Personalized Breast Cancer Management (PBCM) program is a series of consulting service modules designed to assist healthcare institutions in transforming their breast care program through the development of focused operational processes and systems. The goal is to create a personalized end-to-end breast cancer management program that tailors screening, diagnosis and treatment according to individual risk factors and pathology.

Utilizing such a targeted approach can improve a hospital's or clinic's ability to provide timely, high-quality, integrated multi-specialty care for patients. It can also enhance the healthcare providers' ability to increase patient referrals, retention, and operating efficiency. The consulting modules include:

1. Integrated multi-specialty care management: Operational assessment
2. Integrated multi-specialty care management: Process improvement
3. Risk assessment and risk-based screening program – Process design
4. Treatment stratification and planning.

A broad range of benefits

The PBCM program offers healthcare institutions and their patients clinical value by enhancing the opportunity for increased identification of women at high risk for breast cancer; increased early screening and intervention to improve outcomes for high-risk women; and operationally, decreased time to screening, diagnosis and treatment.

The program may also bring significant marketing and strategic value to the healthcare institution by serving as a market differentiator, by anticipating increased future demand from the aging population, and by providing economic benefits to other departments and service lines in the institution.

will then be quantified by changes in metabolic activity. The use of 18F-FDG PET as a glucose surrogate for monitoring therapy response offers improved patient care by individualizing treatment and by avoiding ineffective chemotherapy, or by allowing a change to another chemostatic agent.

Globally, the vast majority of therapeutic monitoring uses the glucose analogue 18F-FDG. Sometimes, however, slightly elevated nodal uptake of 18F-FDG by treated tumors can persist or can be an unwanted side-effect due to inflammatory processes. Therefore tracers such as fluorine-18 fluorothymidine (FLT) (aminoacid analogue) offer promise for this application.

FLT has been developed as a marker for cellular proliferation and, in principle, could be a more accurate predictor of the long-term effect of chemotherapy on tumor viability. A recent study from the University of California, Los Angeles (UCLA) examined side-by-side 18F-FDG and FLT imaging for monitoring and predicting tumor response to chemotherapy (3). The researchers concluded that a 10-minute FLT PET scan acquired two weeks after the end of the first course of chemotherapy is useful for predicting longer-term efficacy of chemotherapy regimens for women with breast cancer.

Other potential uses

Other early studies of PET/CT evaluation of responses to hormonal and/or cytotoxic therapies have yielded very promising results (4). This can potentially provide important benefits to the individual patient by allowing an earlier change to alternative treatments that may be more efficacious, or by avoiding the unnecessary toxicity related to ineffective therapy. Conversely, PET/CT may demonstrate important biological effects despite a lack of apparent morphological response and therefore prevent premature withdrawal of effective therapies.

These capabilities can be of interest to produce cost savings in avoiding ineffective treatment because therapies are becoming ever more expensive. GE Healthcare is striving to support and ease the use of such technology in this environment by providing automatic registration of PET/CT exams and overtime examination comparison solutions.

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More than 2500 babies are born every year at the Barmbek General Hospital (AK Barmbek) in Hamburg, Germany. This makes it one of the largest delivery units in the country.



Complete RENEWAL

of maternal-infant monitoring at Barmbek hospital, Germany

The Barmbek hospital recently decided to create an environment dedicated fully to maternal and infant care, and accordingly these functions were moved into a new building. The delivery room is now next door to the Neonatal Intensive Care Unit (NICU) making baby transfer, data exchange and staff communication easier to manage.

In the same connection it was decided to change the entire labor and delivery monitoring system. The old, heterogeneous installed base of maternal and fetal monitoring devices were replaced with a brand new generation of cardiotocogram (CTG) monitoring.

Barmbek decided to purchase 10 new **GE Corometrics® 250 Series** maternal-fetal monitors, six **Corometrics 170 Series** monitors and two Rimkus T800 telemetry systems for mobile monitoring and under-water delivery.

One of the reasons why the Barmbek midwives made this choice was the high performance of the GE Nautilus™ watertight 9-crystal ultrasound transducers, which make it easy to assess the fetus very quickly. The baby's heart rate (HR) is tracked by the wide beam of the 9-crystal design, which maintains the focus on the baby's heart much longer.

The head midwife **Jutta Ubben** says, "With GE Corometrics, we get good signals externally, from the beginning of labor until delivery."

Added comfort for mother and midwife

In the birthing environment, midwives and parents value the quietness achieved with the advanced technology. The Corometrics 250 Series of monitors is helping the staff to achieve and maintain an environment of comfort by generating less disturbance to the parents during the intimate

and precious time of labor and delivery.

"The mother certainly appreciates the fact that there is no need for frequent repositioning of the ultrasound transducers thanks to their well-engineered design. The flat surface of the toco transducers enables smooth measurements of the contractions, leaving no marks on the mother's stomach. There is also a special night CRG set-up to allow the mother to sleep even when being monitored," Jutta Ubben explains.

The direct key functions and clear visibility further improve the ease of use. Maternal parameters are included in the Corometrics 250 Series, which prevents any loss of data or wasted time when maternal and fetal data are available in a single report. Moreover, the supplies and accessories are fully compatible between the Corometrics 250 and 170 Series and the telemetry system.

After two months of full use of the new CTG monitors, the Barmbek hospital is most satisfied with their new installation. In addition to being a new user of our full range of CTGs, the staff are also very happy with their other infant care devices provided by GE Healthcare, such as the Giraffe® incubators and the new Dash 5000 for the NICU.



BY PETRA HEPP,
APPLICATION SPECIALIST,
PERINATAL CARE,
GE HEALTHCARE GERMANY

MOBILE MONITORING of patients in labor and delivery launched

This exclusive interface enables obstetricians to monitor mother and fetus via a handheld device, providing data wirelessly to obstetricians anywhere, anytime.



The Centricity® Perinatal clinical information system from GE Healthcare now exclusively interfaces with **AirStrip OB®**, a state-of-the-art technology that allows obstetricians to use their PDAs (personal digital assistants) or smartphones to remotely access fetal heart tracings, maternal contraction patterns, and other critical, virtual real-time data from labor and delivery units. GE recently announced an exclusive agreement with MP4 Solutions (MP4) to deliver the Centricity Perinatal solution with AirStrip OB®.

Until now, physicians usually accessed information about the progress of a patient in the labor and delivery department remotely via a phone conversation with a nurse or by using a computer with Internet access – a significant limitation for the demanding schedule of obstetricians. AirStrip OB is accessible anywhere where there is a reliable cellular phone signal.

“AirStrip OB allows me to stay connected to my patients even if I can’t be at their bedside,” says **Dr. George Branning**, MD of Baylor hospital in Dallas, Texas, USA. “I no longer have to rely on Internet connections or potentially incomplete verbal explanations of my patients’ progress. Instead, I can now access critical patient information directly from a handheld device and continue to monitor my patients’ progress during their labor, regardless of my location.”

By interfacing exclusively with GE’s Centricity Perinatal system, AirStrip OB provides obstetricians with the ability to retrieve current and historical patient data, including exams, vital signs, and patient census lists.

This software displays the current waveform data coming from Centricity Perinatal as it would be seen on a monitor in labor and delivery units.

“Our partnership with MP4 demonstrates GE’s continued commitment to personalized healthcare by providing transformational medical and information technologies to bring our customers closer to their patients,” says *Vishal Wanchoo*, President and CEO of GE’s Healthcare Information Technologies.

Developed using Microsoft’s .NET Framework, AirStrip OB incorporates Smart Client technology on smartphone and PDA devices running Microsoft Windows Mobile 2003 operating system and higher. AirStrip OB, which is compliant with the US Health Insurance Portability and Accountability Act (HIPAA), utilizes some of the strictest Internet and wireless security measures available today.

About MP4 Solutions, LP

MP4 Solutions, LP (MP4) is a Texas Limited Partnership formed to create, design and deploy medical software applications that focus on mobile and wireless technologies. Using cutting-edge PDA wireless technologies, AirStrip OB interfaces exclusively with GE’s Centricity Perinatal system to provide obstetricians with the ability to stay in real-time contact with their patients whenever they want, regardless of physician location. For more information on MP4, please visit their website at www.airstripob.com.





A NEW ERA

in healthcare management
opens up in Modena, Italy

BY GUALTIERO FOSCHI,
CLINICAL SYSTEMS AREA
MANAGER MAURO ZANETTI,
CARDIOLOGY SALES
SPECIALIST AND NICOLA
ROSSI, MARKETING DIRECTOR,
GE HEALTHCARE ITALY

The New S. Agostino-Estense Hospital of Modena is part of the Emilia-Romagna regional health service and provides public healthcare services to the province's 650,000 inhabitants. The opening of the New Sant'Agostino-Estense Hospital last year has fundamentally transformed the hospital system of the city of Modena. The new hospital is a technologically sophisticated structure fully equipped to meet the latest healthcare challenges.

The first phase of the new construction, taken into use in July 2005, consisted of the emergency area, four intensive care units (ICUs), a cardiac unit, a cardiovascular area, operating rooms (ORs) and a recovery room. The construction is now complete and the remaining trauma area, stroke unit, ICUs and some stand-alone monitors for the different care areas are completely operational.

The new hospital housing some 570 beds has set itself high goals: to guarantee the best possible patient safety and quality especially in emergency and critical care services; to promote integrated use of medical technology including telecommunications; to promote the best methods of clinical governance; and to control and rationalize management costs.

Integrating clinical data

The evolution of biomedical equipment integration into the hospital IT infrastructure has led to the development of an enterprise-wide solution. Therapeutic, monitoring and diagnostic equipment are specifically designed to be functional components of the solution. When combined with accurate demographic data, this helps to make the information available at the point of need and also at a higher level, containing all data relating to the health services for the city's citizens.

Thanks to the hospital's wide-reaching technological infrastructure (fiber optic, copper and wireless networking), it is possible to access all the data on a given patient from anywhere within the structure.

The clinical information generated by the various devices (ECG recordings, events, etc.) are gathered in clinical databases and structured according to internationally recognized standards. They can then be transmitted to the various parts of the hospital where the patient's data needs to be reported and/or examined.



Excellence in national health service

The investments made in the new Modena hospital include the activation of new services covering the whole province, such as a picture archiving and communication system (PACS) and laboratory services. Consequently, this significant technological modernization is benefiting not only the new hospital structure itself but the entire provincial network.

The biomedical technology set-up of the hospitals in the province of Modena, managed by the Modena local health authority (AUSL), is estimated to be worth more than 100 million euros; the new hospital owns biomedical technology equipment consisting of approximately 2000 machines, for a total value of 42 million euros.

These assets are estimated to be among the most valuable in Italy, at both regional and national level. The Clinical Engineering Service of AUSL, led by **Massimo Garagnani** in collaboration with **Giampiero Pirini**, both senior clinical engineers, ensures that they are managed efficiently, cost-effectively and safely.

"The first step in optimizing the management costs was taken when designing the tender requirements. We have a *single* monitoring system, the configurations are designed by care area and we guaranteed with the equipment chosen that no clinical data are lost during the care continuum within or outside the hospital from the moment the patient is aided by the emergency team," explains Mr Pirini.

"In a word, this results in less costs for training thanks to the equipment's common user interface, less costs for the information and systems integration, and high flexibility for the users as all systems are interchangeable."

The New S. Agostino-Estense Hospital chose GE Healthcare as one of their key partners in this project relying on GE's ability to provide state-of-the-art medical technologies and solutions to help the hospital reach both their clinical and financial goals.

"The equipment installed has a high level of intrinsic sturdiness and reliability. This is clearly a result of a steady and tested technology on top of which an appropriate and precise risk analysis has been carried out," Mr Pirini continues. Regarding the impact on the quality of patient care, he adds, "We are reporting a high level of satisfaction for both the range of diagnostic and monitoring services we provide and for the accuracy of the clinical data acquired. This constitutes the basis for the best possible delivery of diagnostic and therapeutic treatment."

Patient monitoring integrated

The hospital's new patient monitoring system has an integrated design that regards the intensive and non-intensive care areas of the entire hospital as a single complex department. In total, the comprehensive patient monitoring system at the New S. Agostino-Estense Hospital consists of 102 **Solar**® bedside monitors, 59 transportable monitors and 32 telemetry systems transmitters. The system is built on GE's medical network with 15 **CIC**® Clinical Information Centers, guaranteeing maximum continuity, completeness and accessibility of data.

The aim of this continuity and completeness is to guarantee



maximum surveillance of the condition of the patients monitored. The system also provides all the professionals involved in the continuum of the patient's clinical care with the maximum support for decision-making, clinical documentation, clinical and statistical trials and medico-legal procedures.

The clinical connectivity tools also include the **Aware Gateway™ HL7** to ensure a reliable, standardized bi-directional interface with the patient's demographic data on the hospital information system (HIS); the **PDS™** (Patient Data Server) for the management of patient events (up to 500 per patient) and 72-hour trends of the parameters monitored by any device connected to the medical network; the **Patient Viewer™** server for online viewing of the clinical data (waveforms and trends) of the patients monitored on the network; the **ICMMS™** (Integrated Computerized Maintenance Management System) server network application for managing the data of the biomedical devices, such as infusion pumps, anesthesia workstations, pulmonary ventilators, etc., hooked up to the network; the **MUSE® Cardiology Information System** serving as a data management centre for ECGs; and the **Centricity® Critical Care** clinical information system.

Diagnostic cardiology integrated

All the hospital's cardiology reporting activities (ECG recordings, Holter recordings, etc.) are connected to GE's **MUSE** Cardiology Information System, with the capability to be expanded to include other hospital and territorial structures. The strategy is to connect to the system for example defibrillators and monitors operated by the emergency services. This will enable the emergency team to transmit the data directly for consultation purposes to the cardiac department, where the ECG recording can be analyzed and filed with the MUSE system, producing a validated medical report.

The cardiac area of the hospital has also been set up with a hemodynamics room equipped with a high-quality GE **Innova® 2000** cardiovascular imaging system and a **Mac-Lab® IT** hemodynamic monitoring system. The electrophysiology room equipped with the devices required for conducting specific activities, such as pacemaker implants, has a GE mobile X-ray C-arm **OEC® 9800MD PLUS** system for cardiovascular imaging, a cathlab and advanced mapping systems for recording the electrical activity of the myocardium.

In addition to the MUSE system with four workstations and web application for remote consultation, the hospital's cardiac system consists of 50 **MAC® 5000** resting ECG systems and 3 **CASE® 8000** cardiac assessment systems for exercise testing.

Regardless of where they are located in the hospital (bedside, specialist outpatients department, ICU, casualty department) all of the acquisition systems are able to transmit the ECG signal to the MUSE system for clinical reporting.

Thanks to the provision for wireless configuration, wireless communication between ECG stations and central units may be implemented in the future. The reports of the recordings are filed in the MUSE system and can be recalled to the electrocardiogram on the network, printed out from a variety of printers, or sent by email.

It is also possible to hook up from, and to, the HIS in order to receive work lists and demographic data that can be sent directly to the ECGs on the network. This minimizes the risk of new patient data entry errors. Moreover, the recordings and medical reports may be accessed by the HIS for entering on the clinical record card as well as for consultation purposes.

Implementing the vision

Mr Giampiero Pirini, who is the co-ordinator of this very important project, is convinced of the advantages of this modernization and looks ahead to the future.

"Integration of medical devices into the hospital's IT infrastructure has a key role in the diagnostic and treatment procedures and has been a major element in the technical and clinical evaluation of the systems. Our project, which is on the way to becoming a paperless and filmless hospital, is in the forefront at a regional and national level," he explains.

"In cardiology, we are maybe a bit behind compared to other more consolidated industry standards like medical imaging (DICOM standard) or the laboratory (LOINC standard). There's plenty of room for improvement and we need to try, the manufacturer and biomedical engineers together, to find rapidly the most suitable tools to reach this goal in the framework of the IHE (Integrating the Healthcare Enterprise) statements."

The New S. Agostino-Estense Hospital of Modena is a forerunner in the use of information access and management tools and it is sharing its benefits with colleagues in the surrounding hospital facilities.

"We are aiming in the medium term to integrate all ECG recordings from the whole province of Modena. This means that they would come also from other systems," adds Mr Pirini. "To do this we will rely on the excellent collaboration we have enjoyed with GE to help us expand this project which has considerable importance and value for our citizens and patients," he concludes.



GE Healthcare completes ACQUISITION of IDX Systems Corporation

GE Healthcare has completed the acquisition of IDX Systems Corporation, a leading healthcare information technology (IT) provider. Together, GE Healthcare and IDX will create a leading healthcare IT vendor with one of the most comprehensive suites of clinical, imaging and business information systems available.

GE expects the acquisition to accelerate efforts to seamlessly connect clinicians from physicians' offices to hospitals with comprehensive, enterprise-wide electronic health record (EHR) solutions, creating a digital community that supports safe, efficient and cost-effective patient care.

Global adoption of electronic health records

In 2005, the RAND Corporation, a non-profit research organization, released information indicating that America's healthcare system could save more than US\$81 billion annually and improve the quality of care if it were to broadly adopt computerized medical records.

"The combination of these two companies positions GE as a leading provider of global healthcare information solutions and, by further enabling the integration of our customers' IT systems, enhances our ability to help them streamline healthcare costs, reduce medical errors, and improve the quality of patient care," says *Joe Hogan*, President and CEO of GE Healthcare. "In addition, our expanded IT product offerings will provide healthcare practitioners with powerful new capabilities and tools, like comprehensive EHRs, to help physicians diagnose and treat disease earlier than ever before."

Strengthened global presence

With the completion of the transaction, *Vishal Wanchoo*, President and CEO of GE Healthcare's Information Technologies business, will lead the combined business. GE Healthcare's IT business will have its global headquarters in Barrington, Illinois, USA, with major offices in Burlington, Vermont; Boston, Massachusetts; Seattle, Washington; and London, UK, along with satellite offices both within and outside the United States.

According to Wanchoo, the acquisition enables GE to offer a comprehensive suite of financial and business management solutions for group practices, hospitals and integrated delivery networks (IDNs), as well as a combined industry-leading radiology information system (RIS) and picture archiving and communications system (PACS) solution. GE's broad product offerings will help healthcare providers deliver the best quality of care while optimizing business performance.

"GE's acquisition of IDX allows us to provide new and more comprehensive ways for healthcare practitioners to manage the explosion of data that has emerged from the healthcare industry," says Wanchoo. "GE's IT tools, capabilities and global scope have the potential to transform the way healthcare is delivered."

MR-GUIDED FOCUSED ULTRASOUND

attracts more patients and income to Ob/Gyn department

When Itabashi Chuo Medical Center in Tokyo, Japan, decided to become the first hospital in Tokyo to install an ExAblate 2000® system on their GE high-definition magnetic resonance (HDMR) system Excite® 1.5 HD, they did so in order to offer their patients the most advanced therapeutic technology for the non-invasive treatment of uterine fibroids.



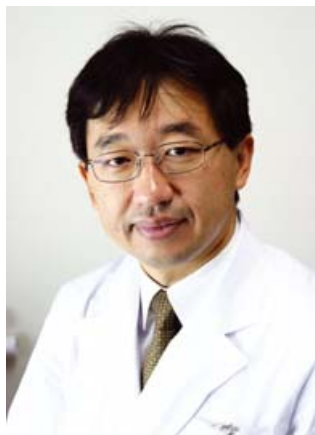
Itabashi Chuo Medical Center

MR-guided focused ultrasound surgery, exclusive to GE's magnetic resonance (MR) systems, is achieved through a partnership between GE MR and InSightec's ExAblate, an innovative technology that uses high-intensity ultrasound beams to heat and destroy fibroid tissue. This groundbreaking non-invasive surgical solution uses MR to visualize patient anatomy, map the volume of fibroid tissue to be treated, and monitor the temperature of the uterine tissue after heating.

Between 20% and 40% of women over 35 years have uterine fibroids. Traditional treatment options for this condition have included invasive and minimally invasive procedures such as hysterectomy, myomectomy or uterine artery embolization (UAE). Hormonal therapy, the only other non-invasive treatment available, offers temporary relief of symptoms.

The MR-guided focused ultrasound procedure offers significant advantages over existing treatments. This is a non-invasive surgical procedure that uses high-intensity focused ultrasound waves to ablate tissue in combination with MR imaging, which guides and monitors the treatment. The procedure typically takes three to four hours. Most women are able to return to work and normal activity within one to two days.

Dr Morita



Unexpected benefits

Dr Yutaka Morita and **Dr Tetsuya Nakamura** fully expected to attract new patients to the hospital. In fact, the procedures using ExAblate 2000 exceeded the total number of procedures conducted in the previous year using all other therapeutic alternatives.

What the department had not counted on was that patient interest would increase so significantly that the total number of uterine fibroid procedures increased by more than 550% in one year. This enabled them to recruit additional doctors and they are now one of the largest obstetrics & gynecology (Ob/Gyn) departments among private hospitals in Japan.

New online symposium brings information directly to physicians

GE Healthcare and InSightec recently launched a new educational web-cast highlighting this new technology. The breakthrough program, titled *New Options for the Management of Fibroids in the Ob/Gyn Practice*, was launched on www.obgyn.net, the number one online resource for obstetrics, gynecology, infertility and women's health. The on-demand presentations from a panel of experts explain how this new alternative can be incorporated in modern Ob/Gyn practice.

Dr Elizabeth A. Stewart, clinical director of the Center for Uterine Fibroids at Brigham and Women's Hospital, Boston, MA, USA, says, "We are fortunate to have focused ultrasound as a new treatment option. My patients are pleased with three key benefits: no incision is required, the uterus is left in place, and there is no hospital stay. We can treat women as out-patients so they can quickly return to normal activities. This is a non-invasive therapy for the 21st century."

Over 700 clinicians worldwide have already registered for this webcast, which will be available until June 2006 at www.obgyn.net/uterine_fibroids.

Unique partnership

GE Healthcare and InSightec are collaborating to deliver this revolutionary new technology. To date, over 1500 women have been treated for uterine fibroids at 30 sites around the world. This method of ablation also has a very promising future. Clinical trials are currently underway for the treatment of bone metastases as well as breast and liver tumors.

ExAblate 2000 is a registered trademark of InSightec Image Guided Treatment Ltd.

FROM TREATING DISEASE to prediction and prevention

The Marunouchi Integrated Health Clinic for Women (IHC Marunouchi) was opened in Tokyo, Japan, late last year. It is an advanced healthcare facility for women aiming to obtain preventive medicine by providing each client with customized healthcare throughout her life, using a database of her medical history for analysis and comparison.

The Breastopia Healthcare Group, which had been specialized in breast disease, established the clinic with a new concept in co-operation with NTT Data Corporation and medical specialists. The underlying belief was that wide-ranging, yet detailed investigations into the influences of female hormones will lead to the ability to detect not only breast diseases but also various other diseases at their early stages, thus opening up the way to preventive medicine.

The concept has three pillars: 1) medical examinations with a high-degree of accuracy by specialists using the



Dr Naoko Shimada, Vice-Director of IHC Marunouchi, with GE's Voluson® 730 ultrasound system

most advanced medical equipment; 2) out-patient examinations by doctors of internal medicine, gynecology, breast care, and psychosomatic medicine, all in close co-operation; and 3) continuous healthcare support using a database and computer technology.

A combination of these is applied to examine the mental and physical health of a woman in an integrated manner. Data collected from these examinations are also compiled to make up a clinical database through a scientific analysis in co-operation with NTT Data Corporation. This database is used in the studies for preventing women's diseases such as breast cancer and osteoporosis.

The new clinic in Tokyo is equipped with GE Healthcare's ECG, bone-density measuring equipment, computed tomography, digital mammography, and ultrasound diagnostic systems. Moreover, it has a Centricity® RIS/PACS system (radiology information system/picture archiving and communications system), which enables centralized management of multi-modality image data, to optimize the healthcare environment.

Optimized isolation of stem cells from umbilical cord blood will advance treatment of **MORE THAN 80 DISEASES**

GE Healthcare and Saneron have announced an R&D agreement to optimize GE Healthcare's **Ficoll-Paque™** density gradient medium for the isolation of mononuclear cells from umbilical cord blood. This cell population contains stem cells with the potential to be used to treat more than 80 malignant, genetic, and acquired diseases, such as leukemia, lymphoma, sickle cell anemia, thalassemia, and immunodeficiency.

“Umbilical cord blood is playing an increasingly important role in the use of cell therapy in the successful treatment of human disease,” says *Nigel Darby*, vice president of research and development, Protein Separations at GE Healthcare.

“Saneron and GE Healthcare are working together to provide a solution for a sterile density medium manufactured under good manufacturing practice (GMP) standards to meet the growing need for processing umbilical cord blood so that it may be used in cell therapy.”

Special separation characteristics required

Ficoll-Paque, a sterile density medium, has been used for 30 years to isolate high yields of mononuclear cells from peripheral blood and bone marrow. However, the cell composition in umbilical cord blood, being significantly different from peripheral blood and bone marrow, demands different separation characteristics. The version of Ficoll-Paque being developed by GE Healthcare and Saneron will specifically process stem cells from umbilical cord blood.

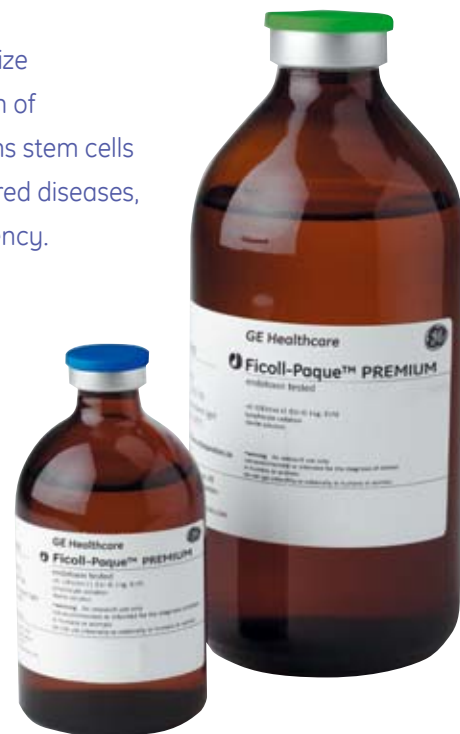
“Saneron has developed a proprietary processing technique for the isolation of a heterogeneous population of cells from umbilical cord blood that has shown promising results in preclinical studies of stroke, myocardial infarction, spinal cord



Ficoll-Paque is a density gradient medium that is used for the isolation of human lymphocytes from peripheral blood. Following centrifugation, lymphocytes appear as a distinct white band in Ficoll-Paque.

injury, and ALS (Lou Gehrig's disease),” says **Dr Cyndy Davis Sanberg**, vice president of research at Saneron. “The cell separation media from GE Healthcare already provides exceptional gradient separation of cells and the new version of Ficoll-Paque will be extremely valuable to Saneron in the completion of proof of principle studies prior to the initiation of future clinical trials. This represents an important milestone in Saneron's cord blood stem cell processing.”

The new Ficoll-Paque is being developed at GE's Global Research Center in Niskayuna, NY, USA and tested at Saneron's facilities at the University of South Florida's research park in Tampa Bay, FL, USA. GE Healthcare will commercialize the final product.



Ficoll-Paque PREMIUM is manufactured according to GMP and ISO standards and is used for the preparation of human mononuclear cells.

ABOUT SANERON

Saneron is a biotechnology R&D company focused on neurological and cardiac cell therapy for the early intervention and treatment of several devastating or deadly diseases which lack adequate treatment options. Saneron, a University of South Florida spin-out company, is located at the Tampa Bay Technology Incubator. An affiliate of Cryo-Cell International, Inc., Saneron is committed to providing readily available, non-controversial stem cells for cellular therapies and has patented and patent-pending technology relating to their platform technology of umbilical cord blood and Sertoli cells.

Breakthrough

IN NEONATAL MATTRESS TECHNOLOGY

Giraffe® Pressure Diffusing Mattress promotes comfort for the smallest patients

GE Healthcare has released the Giraffe Pressure Diffusing Mattress, GE's latest advancement in neonatal mattress technology designed to promote the comfort and health of premature and critically ill infants.

Able to fit both the **Giraffe OmniBed®** and **Giraffe Incubator**, the mattress is intended to help promote infant comfort by providing a softer support surface, relieve pressure points, preserve skin integrity and provide basic topical, anti-microbial and anti-fungal protection. By using pressure-diffusing technology, the Giraffe Pressure Diffusing Mattress may help reduce skin breakdown that ultimately can lead to pressure sores and ulcers.

"Neonatal skin is very fragile. Using a pressure-diffusing mattress helps to ensure better infant comfort and also protects the skin integrity of the child," says *Lynn Lynam*, PhD, NNP, Clinical Manager of Maternal and Infant Care, GE Healthcare.

The Giraffe Pressure Diffusing Mattress has a practical, user-friendly design. It is radiolucent, can be used on either side and is easily cleaned and disinfected between patients. The mattress consists of three critical layers:

- An inner support foam layer of high-resilience foam provides appropriate support and firmness to prevent sagging and uneven wear and to ensure long-lasting comfort and durability.
- Micro-convoluted outer foam layers are separate from the support layer to provide a soft, supportive, pressure-relieving surface and redistribute pressure evenly, allowing the mattress to be used on either side.
- Multi-directional stretch cover fits slightly loosely and is separate from the underlying layers to eliminate stretching or 'hammocking', and prevent stress and discomfort to the infant's skin.

The Giraffe OmniBed and Giraffe Incubator combine state-of-the-art technology, innovative design and exceptional thermal performance to create a user-friendly and developmentally supportive microenvironment that promotes the comfort and health of premature and critically ill infants.





GE expands its healthcare initiative

IN GHANA

In late 2004, GE launched a five-year humanitarian project aiming to bring improved healthcare provision and related infrastructure to hospitals and clinics in Africa. The initiative started in Ghana's capital Accra and in the rural town of Asesewa. It has now been expanded to two additional hospitals in the urban areas Kumasi and Kintampo, Ghana.

“We hope that GE can play a role in reducing mortality rates by providing sustainable access to cleaner water, medical treatment and power in Ghana, and in the future, additional African countries,” says GE Chairman and CEO *Jeff Immelt*. “By combining GE’s wide range of technology, we are bringing together resources to provide long-term solutions to community needs.”

This effort by GE Healthcare, GE Infrastructure and GE Industrial is part of the parent company’s five-year, US\$20 million humanitarian project to provide a combination of healthcare and power generation equipment, water filtration systems, appliances and lighting to a number of sites throughout Africa.

Technology donations

In early October 2005, GE Vice President of Corporate Citizenship *Bob Corcoran* visited the Komfo Anokye Teaching Hospital (KATH) in Kumasi, located in central Ghana. He was joined by KATH Chief Executive *Dr Nsiah-Asare* to commission the product donations, which provide the much-needed infrastructure and technology to enable life-saving healthcare. These include a fluoroscopy unit for radiology, ultrasound devices, incubators, patient monitors, lighting, electrical distribution equipment, water purification and Internet connectivity.

“KATH serves about half of the 20 million people of Ghana as well as the neighboring Burkina Faso and the Cote d’Ivoire as the main tertiary referral centre,” says *Dr Nsiah-Asare*. “The GE donations have come at an opportune time to complement these interventions and boost the capacity of the hospital to render better services to its numerous patients.”

Corcoran also traveled north to commission the equipment at the Kintampo District Hospital, which serves a population of 160,000. Ultrasound devices, X-ray units, anesthesia delivery systems, incubators, power generation equipment, lighting and a water distribution and purification system will enable the rural hospital to help reduce disease and lower maternal and infant mortality. GE has also donated lab equipment and provided Internet connectivity to Kintampo’s Rural Health Training School and the Health Research Centre.

Ghana Health Service Director General **Professor Agyeman Badu Akosa** says, “The commissioning at Kintampo will affect more Ghanaians than any other single healthcare facility in the country. The Rural Health Training School, the District Hospital and the Health Research Centre provide training for Ghana’s entire paramedical staff. Our collaboration with GE will enable a better future and impact many lives.”

Training and support

GE donated the equipment to the U.S.-based non-profit organization Assist International, which in turn donated the equipment to the Ghana Health Services. Assist International and GECAD, a local distributor for GE, provide shipping logistics, ground-level support and site preparation, and on-site co-ordination to ensure timely, cost-effective and quality construction, as well as sustainable operation of the facilities and equipment.

Yibrah Tesfazghi, GE Corporate Regional Executive for Africa, says, “We began our initiative last year, with the majority of work centered in Ghana and smaller donations in Mozambique and Tanzania. There is a tremendous amount of need in Africa, but GE hopes that it can be replicated in a way that is both practical and sustainable.”



GE’s African healthcare initiative was officially launched at two sites in Ghana last year. Medical equipment donations including a cardiothoracic center and critical care monitors assisted the Korle Bu Teaching Hospital in Accra with its mission to train doctors from all of Africa. Medical equipment, power generators, refrigerators and freezers enabled a local clinic in the rural town of Asesewa to upgrade into a district hospital with a doctor on the staff.

Corcoran says, “In addition to equipment donations, we provide the necessary training and support to ensure maximum product efficiency. By combining GE’s technology with our training and management skills, we will ensure a complete and sustainable service in these communities.”

GE has engaged its African American Forum (AAF) to establish on-going relationships at the community level. Each site, once launched, is ‘adopted’ by a GE business-based AAF chapter, which engages senior managers in site visits, initiates benchmarking studies and tracks community health progress. AAF has also sponsored the 2005 ‘Africa Relief Fund’ project to collect school supplies. More than 22,000 items have been collected to send to selected African schools.



GE HELPS TO strengthen education in China

GE recently gave a significant donation to promote education in China. The US\$800,000 three-year grant from the GE Foundation to the China Youth Development Foundation (CYDF) will support the CYDF Project Hope Rural Teacher Training Program, providing 15 training sessions in Shanghai and Beijing for 1500 teachers from the provinces of Yunnan, Guangxi, Jiangxi, Sichuan and Inner Mongolia.



Jeff Immelt, Chairman and CEO of GE, receiving a plaque from CYPD.



The grant was presented by GE Chairman and CEO *Jeff Immelt*, and President and CEO of GE International *Nani Beccalli* at the 2005 class commencement ceremony, which took place at the Great Hall of People in Beijing.

Immelt spoke to the class of more than 100 rural teachers about GE's culture of learning and innovation, and also told them about the teachers who personally impacted his life.

"This is an exceptional model that demonstrates what the public and private sectors can achieve through collaboration and partnership," Immelt said. "A quality education brings a lifetime of opportunities and is the key to long-term success. With this program, teachers will receive the training necessary to improve their schools and their students' ability to learn, grow and continue their academic pursuits."

Teachers from Inner Mongolia performed on a traditional horse-hair violin at the ceremony. After the performance, they presented the violin to Immelt to express their gratitude.

Creating life-changing opportunities for rural Chinese

The grant makes the GE Foundation the largest sponsor of the Rural Teacher Training Program to date. Over the past 16 years since the initial launch of Project Hope in 1989, CYDF has built over 12,000 Project Hope schools in rural and impoverished areas of China in an effort to reduce high student dropout rates, increase student achievement, and develop more effective local schools.

This grant will also enable CYDF to strengthen the Project Hope model through a more collaborative network at the national and

local level among the CYDF organization, Project Hope schools, higher education institutions, the state educational authorities, county youth organizations and other entities.

Xiaojin Gu, Secretary General of CYDF says, "In the past 16 years, Project Hope has brought life-changing opportunities to many children and teachers in the rural areas of China by bringing together all those who care for China. The work that we do today is going to have a great impact on our future. It is very encouraging for us to be able to have such support from a company as reputable as GE, and we sincerely appreciate the generosity of the GE Foundation in support of our effort to educate the rural teachers of China."

Hundreds of thousands will benefit

Many of these participating rural schools are seriously understaffed, with 50 percent of the teachers inadequately trained to instruct their students and also serve as school administrators. The training sessions will be cover four key areas: 1) educational theories; 2) disciplinary reform; 3) school administration; and 4) hands-on skill training. Ultimately, this program will benefit more than 300,000 students.

Beccalli says, "As a company that pursues constant learning, we are pleased to partner with CYDF to enhance the quality of teaching. With nearly 100 years of history in China, a key ingredient to GE's success has been our strong connection with the community. This program with CYDF is a perfect example of how we can help to bring our values and resources to our local communities. In addition to the financial support, our employees will be a strong component of the program, as volunteerism is a strong part of our culture."

WINDOW

THE MAGAZINE FOR GE HEALTHCARE CUSTOMERS AND BUSINESS FRIENDS



GE imagination at work

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