IMAGING Management

Promoting Management and Leadership in Medical Imaging

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February - March

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RADIOLOGY • CARDIOLOGY • INTERVENTION • SURGERY • IT • MANAGEMENT • EUROPE • ECONOMY • TRENDS • TECHNOLOGY

TOP PRESENTATIONS FROM

MANAGEMENT IN RADIOLOGY (MIR) CONGRESS

Outsourcing for Radiology | **Special Focus on Breast Screening Management** | **Advice on Eliminating Waiting Lists**

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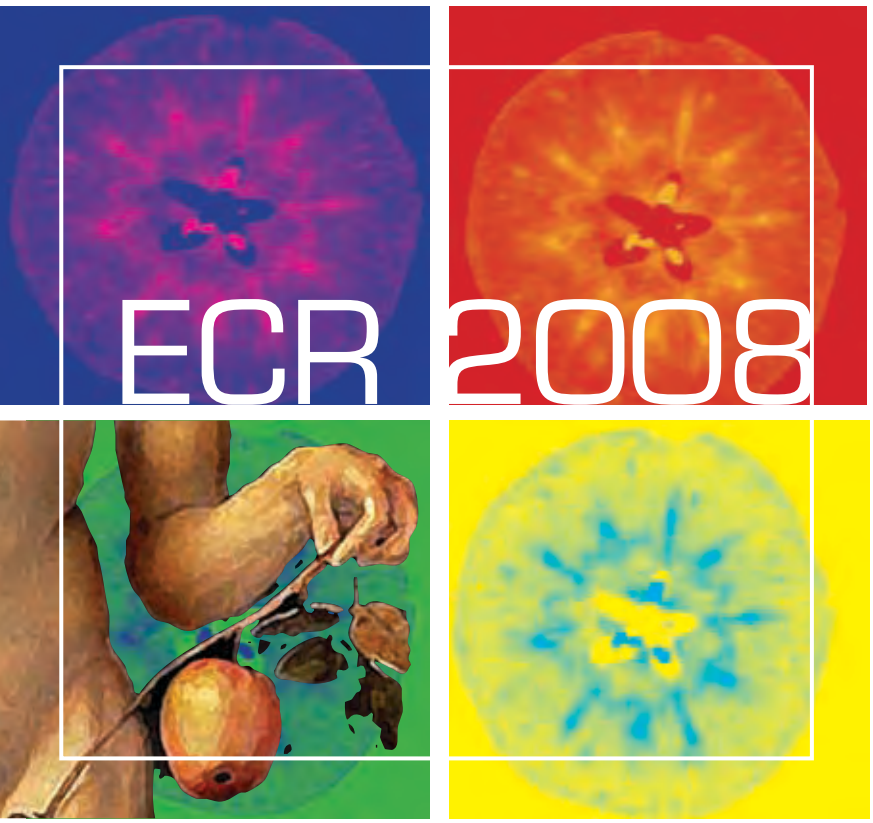
European Society of Radiology

Innovation builds talent



European Congress of Radiology
March 7–11, 2008, Vienna / Austria

See you in Vienna!

March 7–11, 2008

myESR.org

Prof. Iain McCall
Editor-in-Chief
editorial@imagingmanagement.org

Dear readers,

The recent Management in Radiology (MIR) congress, held in Oxford, UK, threw up a number of interesting management challenges and solutions that are being experienced by leaders, managers and administrators of radiology departments worldwide. Each year, IMAGING Management has the honour to publish a selection of papers arising from presentations delivered at the event, with the aim of raising awareness of the most pressing management concerns affecting you, our readers.

Hosted and organised by Dr. Nicola Strickland on behalf of the European Society of Radiology (ESR), the annual MIR meeting attracted professionals from across 29 countries and led to a range of interesting conclusions.

One of the most provocative sessions was based on the growth of pay-for-performance in medical imaging and what the future impact may be on our profession. We already know that a key issue here is that the method of reimbursement for imaging varies considerably from country to country in Europe and internationally. Ranging from a block budget allocation from the hospital, through proportional payment from a diagnostic related group (DRG) case to direct payment for an individual examination, usually based on a tariff agreed nationally or by health insurance or funding boards, this area can be problematic.

However, unless the method of payment to the imaging department is case-based, it is always going to be difficult to match staff and equipment resources to the necessary workload. This may be achieved by the department re-charging the hospital for their agreed activity-based share of the hospitals' DRG payment or by a completely separate payment system outside the DRG process from the insurance company or funding board. The latter is more likely to happen in the clinic environment than for imaging performed on inpatients, and requires sophisticated billing and payment systems based on prior agreement, regarding the level of remuneration for each imaging examination.

The system of Relative Value Units (RVU) as devised and used in the US is a good example. Prof. Michael Pentecost takes us further along this road in his paper on payment by performance, which brings improvement of quality and efficiency into the payment equation. In this regard the quality of the images, speed of access, timeliness of report and the overall standard of the imaging environment can all be measured and included in the service level agreement. Payment may be made dependent on achieving pre-agreed standards and varied to produce the necessary incentives and penalties. This reinforces the message of quality, which is a necessary and important development.

If, however, pay-for-performance of an imaging examination relates to clinical results as suggested for certain clinical conditions, then the auditing implications for radiology departments in terms of organisation and cost would be enormous, not to mention difficulties in follow-up data collection, the lack of good gold standards and the relatively poor consistency in peer review of cases.

Another innovative session at MIR on "The Ten Commandments for Managing an Imaging Department" brought out a variety of issues from the speakers, all Chairs of major departments around the world. One of the common themes raised by many was the importance of teamwork and in particular recognising the value of all members of the imaging department. Good staff management and delegation that is appropriate, properly supervised and supported by training is essential for the success of a department. A well-organised and formative appraisal system is of value and department Chairs must be approachable by all their staff.

It is also essential that Chairs of departments have adequate human resource support and training. Which leads me to my final observation regarding adverse incident reporting: a "no-blame" culture is impossible in most cases, but the recognition and reporting of adverse incidents is fundamental to safe medical practice, and difficulties in problem-solving are often created by defensive attitudes within an organisation.

I would like to take this opportunity to wish you all a productive and successful New Year and remind you that your suggestions and feedback on medical imaging management topics remain sincerely welcome.

Prof. Iain McCall

HAVE YOUR SAY! Letters to the Editor at editorial@imagingmanagement.org

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IMAGING Management

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Association News

MIR Holds Workshop on "Applying Industry Leadership Concepts to Healthcare"

Management in Radiology (MIR) recently held a three-day workshop in Bad Gastein, Austria, from January 10 – 12, 2008. The workshop programme explored key concepts required to enhance a manager's ability to work effectively within an organisation focusing on key components such as emotional intelligence (EI), why high performance teams are critical for success and keys to successful communication.

The opening day of the workshop programme highlighted the use of emotional intelligence as an advantage, an interactive session that focused on the fundamental concepts of EI such as its impact on the individual, those you manage and/or work with and finally, the organisation. This was followed by the opportunity for participants to apply the EI concepts to their own personal situation or management style to identify key areas of interest and create personal development plans.

The second day of the workshop aimed to develop "high performance teams for a high performance organisation". It kicked off with a session showing why high performance teams are critical for an organisation's success. Participants experienced models and tools to build high performance teams and get an understanding of how feedback and coaching develops individuals to enhance the performance of a team. This was followed by the opportunity to practice the concept of feedback and coaching. The final day aimed to help attendees to deliver a compelling message. In particular, it highlighted how the ability to communicate effectively is a key attribute of successful leaders, and was designed to help the individual to improve their ability to influence others, manage conflicts and come across as a more self-confident presenter.

The next MIR event will be its annual congress, set to take place in Athens, Greece during October, 2008. Further developments will be covered in IMAGING Management, with additional information accessible as it becomes available, on www.mir-online.org.

Call for Papers: ISCAS, EuroPACS, CARS, CMI, and CAD 2008

The annual CARS, ISCAS, EuroPACS, CMI, and CAD four-day congress 2008, to take place in Barcelona, Spain from June 25 – 28, 2008, consists of invited talks by internationally recognised experts, over 200 paper presentations, as well as exhibits and posters. Special focus sessions as well as product exhibits in the industrial exhibition are planned, to give participants access to hot topics and new CARS-related products.

Congress Topics

22nd International Congress and Exhibition on Computer Assisted Radiology
Chairman: Stanley Baum, MD (US)
Co-chair: Luis Donoso Bach, MD (E)

- Medical Imaging, e.g. CT, MR, US, SPECT, PET, DR, Molecular Imaging, and Virtual Endoscopy
- Computer Assisted Cardiovascular Imaging
- Image Processing and Display
- Medical Workstations
- Interventional Radiology
- Minimally Invasive Spinal Therapy
- Image Guided Diagnosis and Therapy of the Prostate
- Ablation Therapies
- Image Guided Radiation Therapy
- Nanotechnology for Imaging and Therapy
- Telemedicine, e-Health and Multimedia EPR
- Expert Systems and Computer Assisted Education
- Economic and Management Issues
- Security, Legal and Ethical Aspects

12th Annual Conference of the International Society for Computer Aided Surgery
President: Takeyoshi Dohi, PhD (J)

- Computer Applications for e.g. Neurosurgery, Head and Neck, Orthopaedics, Ear Nose and Throat.
- Cardiovascular and Thoracoabdominal Surgery, and Plastic/Reconstructive Surgery
- Image Guided Therapy
- Image Processing and Visualisation
- Surgical Robotics and Instrumentation
- Surgical Navigation
- Surgical Simulation
- 3D Modelling and Rapid Prototyping
- Postoperative Result Assessment
- Surgical Education and Training

10th International Workshop on Computer-Aided Diagnosis (CAD)
Chairman: Kunio Doi, PhD (US)
Co-chair: Ulrich Bick, MD (D)

- CAD for Breast, Chest, Colon, Skeletal, Liver, Brain and Vascular Imaging
- CAD for Cancer Screening
- CAD for 3D Imaging
- CAD for Differential Diagnosis
- Image Databases for CAD
- Computer Vision, ANN and Modelling
- Computerised Detection and Characterisation of Lesions in Radiological Images
- Quantitative Analysis of Image Information
- Visualisation and Quantitation of 3D Images
- Intelligent Workstations and Decision Support Systems
- Observer Performance Studies and ROC Analysis
- Image Quality Issues and Evaluation

14th Computed Maxillofacial Imaging Congress
Chairman: Allan G. Farman, PhD, DSc (US)

- New Imaging Devices and Novel Applications
- Evidence-based Selection Criteria in Digital Maxillofacial Imaging
- Craniomaxillofacial Computer-Aided Diagnosis
- Maxillofacial Image Enhancement Algorithms
- Cranial and Maxillofacial Image Guided Surgery
- Image Navigated Dental Implantology
- Orthodontic Applications of Computed Imaging

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- Cone Beam CT
- 3D and 4D Imaging
- Multi-Dimensional Maxillofacial Modelling
- Virtual Reality and Dental Robotics
- Interoperability
- Maxillofacial Applications in Integrating the Healthcare Enterprise

26th International EuroPACS Meeting
President: Jarmo Reponen, MD (FIN)

- PACS Planning and Purchasing Strategies
- PACS Evaluation and Economical Aspects
- PACS Beyond Radiology (Cardiology, Endoscopy, Ophthalmology, etc.)
- Image Distribution, Storage and Archiving Strategies
- Workflow and Data Flow in Radiology
- PACS/RIS/HIS Integration Issues
- Regional PACS and Teleradiology
- Cross-Border Experiences
- Security and Privacy, Quality Assurance, Legal Aspects
- Standardisation (DICOM, HL7, IHE)
- PACS and e-Learning in Radiology and Medical Sciences

9th CARS/SPIE/EuroPACS Joint Workshop on Surgical PACS and the Digital Operating Room
Chairmen: Osman M. Ratib, MD, PhD (CH), Heinz U. Lemke, PhD (D)

- Surgical Workflow
- Digital Operating Room
- Model Guided Therapy
- Therapy Imaging and Model Management Systems
- Surgical PACS
- DICOM in Surgery
- Surgical IHE
- Nanotechnology for Interventions

Submissions Welcome

Abstracts or papers including new methods, devices and applications, clinical studies, position papers, and poster topics for presentation at the congress are welcomed. Submissions will be peer-reviewed by members of the international programme committee. Abstracts of accepted lecture and poster presentations will be published in the proceedings, a supplement of the International Journal of CARS, which will be distributed to all congress participants. Paper contributions will be included in regular issues of the international journal of CARS. Authors should send their submissions through the CARS website, see further information and guidelines at http://www.cars-int.org/Authors/cars_2008call_for_papers.htm.

UPHS Expansion Taps ECRI Institute for Purchasing Guidance

As construction continues on the University of Pennsylvania Health System (UPHS) Perelman Centre for Advanced Medicine, consultants from ECRI Institute have begun work on the equipment procurement phase for the 232 million dollar facility. ECRI Institute's strategic technology planning experts are providing technology gap analysis as well as procurement decision support for this landmark project.

The Perelman Centre for Advanced Medicine, set to open in stages through December 2008, is the largest capital project undertaken in the history of the University of Pennsylvania Health System. The facility will house the health system's Abramson Cancer Centre, radiation oncology and cardiovascular medicine departments, and an outpatient surgical pavilion, as well as the Roberts Proton Therapy Centre, a first-of-its-kind proton therapy centre for the treatment of cancer.

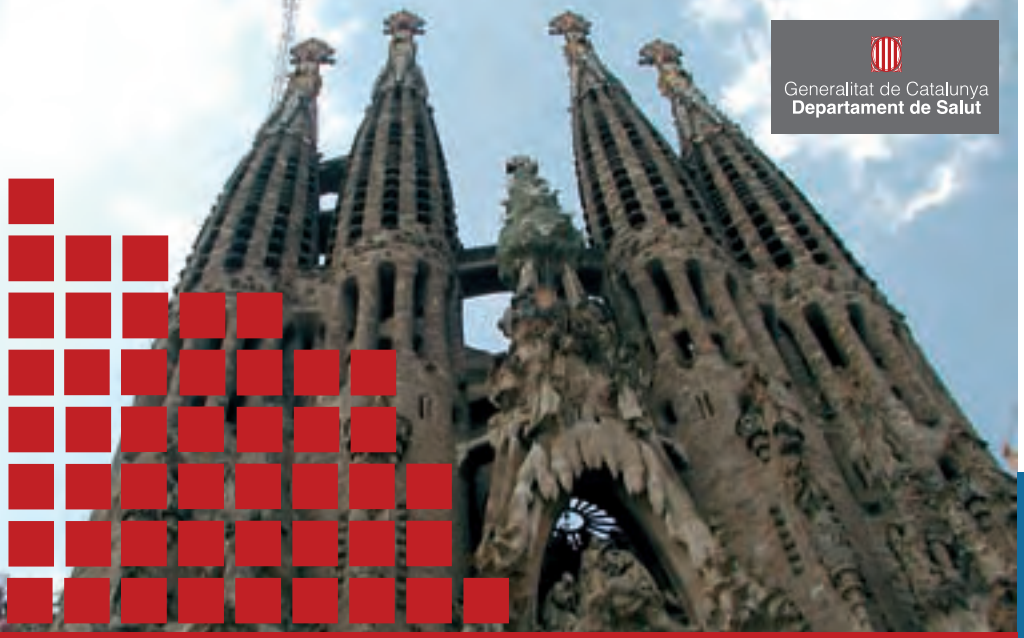
Consultants from ECRI Institute's Applied Solutions Group are providing purchasing advice with the intention to save costs for the equipment procurement phase of the construction project, including guidance on reusing existing equipment and establishing delivery methodologies. These experts are currently assessing the best ways to reuse and procure architecturally significant equipment, such as surgical booms and lights, operating room integration systems, and the latest imaging technologies.

Dates Announced for CIRSE 2008, Copenhagen, Denmark

The CIRSE congresses have become Europe's most comprehensive interventional meetings focusing on raising the profile of cardiovascular and interventional radiology, and attracting public awareness and political attention. Next year's edition is scheduled to take place from September 13 - 17, 2008, in Copenhagen, Denmark.

2008 will see twelve ESIR courses organised by the CIRSE Foundation, including four institute courses held at the European Surgical Institute in Hamburg, Germany and at the Crossroads Institute in Diegem, Belgium. Due to its success in 2007 there will again be one RFA course held in the French language in Strasbourg, France. The ESIR course programme during 2008 includes the following dates and themes:

- "Ablation Tumorale par l'Image", Strasbourg (FR), March 28 - 29, 2008
- "Peripheral Arterial Disease", Amsterdam (NL), March 28 - 29, 2008
- "Aortic Diseases", Budapest (HU), May 30 - 31, 2008
- "Varicose Veins", Winterthur (CH), June 20 - 21, 2008
- "Image-Guided Radiofrequency Tumour Ablation", Heraklion (GR), July 18 - 19, 2008
- "Non-Vascular Upper GI Interventions" Novi Sad (RS), October 10 - 11, 2008
- "Peripheral Arterial Disease" Hamburg (DE), October 17 - 18, 2008
- "Carotid and Renal Stenting" Prague (CZ), October 31 - November 1, 2008
- "Vascular Interventions - Basic Course", Moscow (RU), November 7 - 8, 2008
- "Carotid Stenting", Hamburg (DE), November 14 - 15, 2008
- "Carotid Artery Stenting Hands-On Course", Diegem (BE), November 20 - 21, 2008
- "Interventional Treatment of Peripheral Arterial Disease", Diegem (BE), November 27 - 28, 2008



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CARS 2008
Computer Assisted Radiology and Surgery
22nd International Congress and Exhibition

June 25–28, 2008
***Barcelona**, Spain*

Main Themes

- Medical Imaging
- Cardiovascular Imaging
- Computed Maxillofacial Imaging
- Image Processing and Display
- PACS and IHE
- Telemedicine and E-Health
- Computer Aided Diagnosis
- Computer Assisted Radiation Therapy
- Surgical Navigation
- Surgical Robotics and Instrumentation
- Surgical Simulation and Education
- Computer Assisted Orthopaedic and Spinal Surgery
- Computer Assisted Head and Neck, and ENT Surgery
- Image Guided Neurosurgery
- Minimally Invasive Cardiovascular and Thoracoabdominal Surgery

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For detailed information please visit
www.cars-int.org

ALLIANCE FOR MRI WELCOMES POSTPONEMENT AND AMENDMENT OF EU DIRECTIVE

The Alliance for MRI has welcomed the European Commission's announcement that it will postpone and amend legislation which would pose a serious threat to the use of Magnetic Resonance Imaging (MRI) in patient welfare and scientific research.

The EU Physical Agents Directive 2004/40/EC (EMF) is to be delayed by four years until April 30, 2012 to allow time for a substantive amendment to be adopted. The Alliance welcomes the Commission's statement that "The future amendment will aim to ensure that limits will not have an adverse effect on the practice of MRI" and the recommendation to Member States to put the transposition of the current Directive on hold.

If implemented, the Directive would prevent healthcare staff from assisting or caring for patients during imaging. It would mean that some patients who cannot be imaged without this care – if they are young, elderly, frail or confused – would either be denied imaging or have to undergo alternative procedures such as x-rays.

Leading Experts Comment

"MRI is a powerful, non-invasive and safe diagnostic and research tool," says Prof. Gabriel Krestin, a leading member of the Alliance for MRI and professor of radiology at Erasmus University Medical Centre, Rotterdam, in the Netherlands. "However, its application often relies crucially on the presence of a healthcare worker or researcher. If the European Commission legislation were implemented, it would almost certainly be a major setback for scientific research, denying patients innovative treatments in the future."

The Alliance for MRI, which represents a coalition of European Parliamentarians, patient groups, leading European scientists and the medical community, has campaigned to bring attention to the potential plight of patients.

In June 2007, the Alliance for MRI held a lunch at the European Parliament with Commissioner Spidla to discuss research undertaken by Professor Stuart Crozier of Brisbane University, Australia, which vindicated the Alliance's concerns.

In addition to its serious impact on healthcare, the Alliance believes the Directive would threaten Europe's position as world leader in MRI research. The Alliance for MRI believes that it is essential to evaluate the real risk to patients which would be brought about by impeding the full use of MRI, against an unproven risk to workers.

A FORUM FOR EMPOWERING PATIENT ADVOCATES

The European Society for Medical Oncology's (ESMO) annual forum was held in Brussels, Belgium under the auspices of the ESMO Cancer Patient Working Group, to bring together international cancer patient associations to encourage exchange of best practices, facilitate network-building amongst the groups and to provide the skills and techniques needed to develop and implement effective advocacy strategies.

The forum provides the platform for stakeholders to discuss shared issues, seen from different perspectives, and to come up with standard action plans essential for success. "Cancer patient organisations need to promote a common vision with all stakeholders before targeting the European institutions," recommends Adamos Adamou, a medical oncologist, MEP for Cyprus and Co-chair of the MEPs Against Cancer (MAC) group.

Advice on Interprofessional Cooperation

Heinz Ludwig, ESMO Cancer Patient Working Group, presented models for interprofessional cooperation, such as the ASCO-ESMO Consensus Statement on Quality Cancer Care and the annual ESMO Patient Seminars. He noted that "As a consequence of the fact that cancer care is multi-dimensional, collaboration is necessary." He added that we must "... train doctors to be better caregivers and engage patients in proactive and open communication with their doctors."

Doctors, patients and advocates must work together to create an ethical and human environment considering factors such as:

- Drug approval
- Reimbursement of drugs
- Patient rights
- Physician skills
- Information to patients
- Adequate funding

Much discussion also took place around how to implement needed changes in:

- Training and educating
- Quality control
- Putting pressure on healthcare systems
- Demanding higher standards
- Creating and implementing European cancer plans

Anita Waldman, Deutsche Leukaemie–und Lymphom-Hilfe, Germany summarised discussions about the doctor/patient relationship as well, saying "Medical support can be optimal in situations where social support is not adequate."

Media Relations Workshop

The ESMO Cancer Patient Advocacy Forum closed with Lynn Faulds-Wood, Bowel Cancer Campaign, UK, who gave a dynamic, interactive presentation with recommendations on how to get the attention of the media. She provided concrete examples and led a lively discussion where participants shared success stories. The importance of partnering with the media is not to be underestimated. Advocacy groups need to become media savvy as capturing media attention creates awareness and educates the general public about the disease.

Dervla Gleeson
Managing Editor, IMAGING Management
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Medical Doctors (respond below)

1. What is your occupation? (check only one)
   - ❑ Diagnostic Radiologist
   - ❑ Other Physician (please specify)

1a. What is your radiology sub-specialty? (check only one)
   - ❑ General Radiology
   - ❑ Neuroradiology
   - ❑ Nuclear Medicine
   - ❑ Vascular & Interventional
   - ❑ Nuclear Radiology
   - ❑ Cardiovascular Diseases
   - ❑ Paediatric Radiology
   - ❑ Other (please specify)

1b. I am Chief of my Department
   - ❑ Yes
   - ❑ No

Non-physician professionals (respond below)

1c. What is your occupation? (check only one)

Administrator/Manager:
- ❑ Radiology Administrator
- ❑ Radiology Business Manager
- ❑ PACS Administrator

Executive
- ❑ Chief Information Officer / IT Manager
- ❑ Chairman / Managing Director / Executive Director
- ❑ Chief Financial Officer / other executive titles

Other
- ❑ Medical Physicist
- ❑ Academic
- ❑ Chief Technologist / Senior Radiographer
- ❑ Manufacturer
- ❑ Business Consultant
- ❑ Distributor / Dealer

All respondents reply to the questions below

2. In what type of facility do you work? (check only one)
   - ❑ Private clinic
   - ❑ Hospital (check number of beds)
   - ❑ More than 500 beds
   - ❑ 400-499 beds
   - ❑ 300-399 beds

3. With what technologies or disciplines do you work? (check all that apply)
   - ❑ Diagnostic X-ray
   - ❑ Nuclear Imaging
   - ❑ Interventional Radiology
   - ❑ CT
   - ❑ Ultrasound
   - ❑ MRI
   - ❑ Mammography
   - ❑ Bone Densitometry
   - ❑ PACS/Teleradiology
   - ❑ Cardiac Imaging
   - ❑ PET
   - ❑ Echography
   - ❑ Angio/Fluoroscopy

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Industry News

Siemens

Siemens MR used in Mummy Bone Structure Scan

Siemens and a team of researchers from the University of Zurich collaborated on a recent MR scan of a historical mummy to answer the question: Can the new software for magnetic resonance (MR) tomographs provide insight into the anatomy and disease characteristics of the human being, even for those parts of the human body which, even more so for a mummy, contain almost no water? Siemens is currently developing specific software for picking up the signal from dry tissue and converting it into sharp images. This software might allow visualisation of even fine bone structures without x-rays in the future.

Up to now, visualisation of body tissue through an MR system was only possible based on the tissue's different water contents. Hence, it was primarily soft tissue that physicians saw on MR images and not, for example, details of the bone structure, as will be possible with the new software. "Not only orthopaedic surgeons will be pleased, our software will also support neurologists when examining, for example, patients with Alzheimer's disease with the aid of such MR images, or monitoring the body metabolism," explained Walter Märzendorfer, the head of Magnetic Resonance at Siemens Medical Solutions.

Boston

Boston Scientific Sells Two Businesses

Boston Scientific has agreed to sell its fluid management and venous access businesses to a private equity firm for 425 million dollars in cash. The sale of the two units is part of Boston Scientific's plan to divest certain non-strategic assets. The combined units are expected to operate as an independent company under a new name once the deal is complete, according to the company. Prior to this sale, the company began the process to sell its cardiac and vascular surgery businesses to Getinge Group for 750 million dollars.

Matrox

Matrox Announces New Distributor

Matrox Imaging has announced the appointment of InviSys SVC Ltda as the official Matrox Imaging distributor in Brazil. InviSys will sell Matrox Imaging's complete line of hardware and software components for industrial and scientific imaging applications.

"Brazil's economy stands out in South America, and its expansion means there is great potential for the machine vision market," explains Sam Lopez, Matrox Imaging Sales Manager Europe and South America. "InviSys has valuable experience in areas such as biometrics, intelligent video analysis, and artificial intelligence – experience that will integrate nicely with Matrox Imaging's product line."

IBM

IBM to Acquire Arsenal Digital Solutions

IBM will acquire Arsenal Digital Solutions, an online data storage services and data protection services company. Arsenal Digital of Cary, N.C., and its 100 employees will become part of IBM Global Technology Services, IBM's largest business unit headquartered in Raleigh, N.C., US. IBM said that the acquisition will not result in any layoffs.

Arsenal Digital serves approximately 3,400 customers in small and midsize businesses that want data protection and online access in response to regulatory requirements and data growth. Previously, IBM had partnered with Arsenal for several years on specific orders. Other storage competitors, such as EMC, have recently made such acquisitions of online storage providers. IBM's move adds an online option for customers who tell IBM their data is growing at 40 - 50 % per year.

Carestream Health

Ultrasound Associates Purchase Carestream Health Outpatient Solution

Carestream Health, Inc., announced that Ultrasound Associates has purchased its KODAK Carestream Outpatient Solution, a new turnkey digital imaging and information management package designed for imaging centres. Ultrasound Associates provides women's health services including diagnostic and screening mammography exams, high-risk OB/GYN ultrasound, and bone density studies. The sale was initiated by X-Ray Visions, Inc., a partner for Carestream Health. The Carestream Outpatient Solution incorporates a fully integrated KODAK Carestream RIS/PACS with system design and project management services as well as workflow optimisation planning.

Sectra

Sectra Provides Low-Dose Breast Scans to Belgian Hospital

The St. Trudo regional hospital in Belgium has invested in the digital mammography system, Sectra MicroDose Mammography. This is the first Belgian order for Sectra's digital mammography system, which provides the lowest dose on the market. Early detection of breast cancer saves lives and approximately two million Belgian women undergo mammography examinations each year. With this order, the St .Trudo Hospital will be the first in Belgium to offer women mammography examinations with the lowest radiation dose on the market.

The order also comprises Sectra breast imaging PACS, Sectra's system for processing and archiving patient data and images. The system will be integrated to the existing hospital image management system and combined with Sectra MicroDose Mammography to form a complete digital solution.

Elekta

Elekta Supply French Hospital with IGRT Systems

The University Hospital Centre (CHU) de Poitiers in France has ordered three Elekta Synergy digital linear accelerator systems for intensity modulated and image guided radiation therapy (IGRT) to improve radiation therapy treatment capacity. The order will generate close to 7.24 million dollars for Elekta.

GE Healthcare

GE, CenTrak Release RFID Tracking System

GE Healthcare has released a radio frequency ID (RFID) tracking system in partnership with CenTrak. The companies said their RFID systems will empower facilities to reduce installation costs compared to current RFID systems, enabling them to maximise ROI potential. The system also has the ability to view locations at the room level, the companies said.

Fujifilm

Fujifilm Sponsors Educational Grants

Fujifilm Medical Systems, US, is funding educational travel grants for two radiology residents to attend the American Roentgen Ray Society (ARRS) annual meeting, held April 13 - 18, 2008.

The grants will help cover registration and courses for the entire ARRS meeting, as well as lodging and travel. The award winners will be notified 25 February, and formally recognised at the Scholars and Awards session during the annual meeting.

Zonare

Cruise Line Launches Study of Zone Sonography Technology

Zonare Medical Systems has announced its z.one ultrasound system recently set sail on the U.S.S. Amsterdam, a flag ship of Holland America Line, for its 114-day around the world trip. Under the direction of Carter Hill, MD, medical director of Holland America, the z.one system, based on Zone Sonography technology, will be used in support of diagnosing passengers in need of medical attention during the cruise. The outcome of the four-month study could determine the future use of ultrasound imaging on passenger cruises.

Aurora

Aurora Breast MRI System Now Available at Ohio Imaging Centre

Aurora Imaging Technology Inc. announced that the Aurora® 1.5T Breast MRI System has been installed for the first time in Ohio at the Toledo Hospital Breast Care Centre as part of a joint venture with Toledo Radiological Associates. The Toledo Hospital is part of the ProMedica Health System. The Aurora System is the only FDA-cleared dedicated breast MRI system specifically designed for the detection and diagnosis of breast cancer.

THE TEN COMMANDMENTS FOR MANAGING AN IMAGING DEPARTMENT

Session Summarises Key Guidelines

This session was a novel venture staged for the first time at MIR 2007, Oxford, UK. Six well-known radiologists from different countries took fifteen minutes each to put forward their individual 'Ten Commandments' that also reflected imaging management practices in their own countries. The session was then opened up to the floor and there was extensive discussion and contribution by the audience. The main additional points were collated in real time onto the overhead projector by Dr. Strickland, whilst Prof. Gishen hosted the overall session and directed the discussion, in this dynamic and highly entertaining session. Many of the speakers touched upon similar ideas, which we have summarised under headings below.

Summary drafted by:
Dr. Nicola Strickland (Chairman, MIR, UK)
Prof. Philip Gishen (Session Chair, UK)

Presenters
Prof. Tchoyoson Lim (Singapore)
Prof. Guy Frija (France)
Dr. Sergei Nazarenko (Estonia)
Prof. Henrik Thomsen (Denmark)
Prof. Michael Pentecost (US)

Focus on Manpower Issues

A variety of conclusions were gathered from presenters, as summarised below.

Prof. Gishen stressed the following points:

• Imaging should be categorised into organ, disease and age-based (paediatric and neonate) specialists, rather than confined to modality-based specialists. All radiologists should have a working knowledge of the modalities needed to optimally image their specialist organ or disease system.

• Timetabling is vital to provide a robust service. Extended days are recommended, starting at 7am (or earlier, according to the preference of the radiologist) and ending routinely as late as 9 or 10pm. Radiographers and radiologists need not work longer, just smarter. IT technologies including PACS, remote electronic requesting, speech recognition and mobile communication have opened up the possibility for radiologists to work at times which suit them. Individual timetables are scheduled on an hourly basis, with every hour in the day assigned, with contact numbers and locations enabling the radiologist to be contacted directly. Provided the requisite amount of clinical activity is performed by the individual radiologist, the remainder of their time is organised into administration, research and teaching activities.

• Covering the on-call service is never a popular task, and is best achieved by interventional radiologists who are paid extra for their on-call duties. Proper remuneration increases the popularity of an on-call service.

• If a new procedure is introduced then at least two senior radiologists must be trained in this technique so that they can cover each other's absence and offer continuity of service.

• Whilst frank exchange of views, and honest discussion of controversial issues is to be encouraged, "going to war with a colleague" should be avoided at all costs to preserve a good working environment.

Prof. Guy Frija from Paris, France added the following observations:

• Productivity in managing an exemplary imaging service is three-pronged and requires assessment of quality of reports and imaging procedures, research output, and workflow turnaround times.

• Appropriate delegation can increase the efficiency of managing an imaging department, but only if those delegated to are properly supervised and supported.

• Current management of any department requires objective planning for the future.

Prof. Michael Pentecost from Washington DC, US added:

• Human resources are the most important contributor to good management. Having a cohesive and competent staff is paramount.

• Imaging results must be distributed promptly and widely to all referring clinicians and other legitimately interested parties.

• All professionals must be respected, including those not directly responsible for clinical care: all members of the team contribute to good management.

• In an imaging department it is the radiologists (i.e. fully trained and qualified doctors) who perform, and are responsible for, all the imaging studies, interpreting the results and distributing the findings.

Prof. Henrik Thomsen of Copenhagen, Denmark observed:

• A lack of radiologists in certain countries will necessitate the most efficient practices.

• Motivation is vital to the success of managing any imaging department. Small measures such as publishing personal successes and news in an internal newsletter can help to build a motivated team.

• Mutual trust between colleagues, founded upon honesty and respect, forms a firm basis for successful management.

Dr. Sergei Nazarenko of Tallinn, Estonia reminded us that:

• Good management depends upon optimal balancing of personnel, technology and a spectrum of skills.

• A "clash of civilisations", especially in Eastern European countries, needs particular attention. A sudden influx of sophisticated technology into a new department, and the exposure to leading-edge practices needs to be assimilated with care and expertise.

Prof. Tchoyoson Lim from Singapore stressed:

• Good training for all members of staff within the healthcare team is essential for good management. Team work can be helped by professional and social unity.

Session Emphasises Importance of Reward

All speakers agreed that rewarding success was extremely important, and that whilst criticism and self-improvement are to be valued, one must not forget praise where praise is due and the importance of small rewards for minor improvements.

Prof. Lim drew attention to the importance of generating revenue and managing expenses in a business-like fashion as an aid to good management. Prof. Gishen touched upon the sometimes sensitive issue of private practice, especially when this is carried out in a state healthcare system. Fair sharing out of the rewards of such private practice encourages all members to contribute to such a scheme. In a partnership not everyone does the same amount of work. Alternative rewards should also be offered, such as the possibility of having extra leave or time off instead of extra pay, which may suit some team members better than remuneration. Extra pay for on-call duties is an effective motivator.

Managing Research/Academic Departments

Prof. Gishen said that it was important to keep an up-to-date list of the number of grants, peer-reviewed papers, invited lectures and proffered papers that are given by all members of the department. Personal contributions in this field must be recognised as part of good management

Prof. Frija divided this area into the subheadings of education, ethics approval, good statistics and publications.

Prof. Pentecost reminded us that radiologists are great teachers, and generally love teaching (and collecting good cases!). They should be encouraged to educate colleagues and other clinicians; and management should concentrate upon providing them the IT facilities to carry out these activities in this digital age.

Prof. Thomsen echoed the importance of publications and education in this area. He also advocated motivating continuous education on a personal level, and the importance of organising and attending academic congresses.

Department Working Times

Prof. Gishen outlined the importance of patient and physician satisfaction resulting from good management of departmental working times.

• Zero waiting lists can be achieved by empowering radiographers (technologists) to be responsible for departmental turnaround time in their particular areas. Prof. Lim also explained how to achieve shorter appointment times and waiting times, with faster report turnaround. He too highlighted the importance of meeting the expectations of patients and clinicians.

• A communal reporting room with numerous PACS workstations and immediate reports via speech recognition has proved highly successful in Prof. Gishen's case, in promoting informal double reporting, "a fun working environment" and promotion of social interaction and team building between colleagues.

• The overall philosophy is to work smarter not longer.

These sentiments were added to by Prof. Frija who drew our attention to the importance of trying to promote the quality of reports as well as their quantity and turnaround time. Prof. Thomsen reminded us how important it is for the Head of department to be visible and accessible to colleagues within the department.

Imaging Equipment

All speakers felt this was an important issue for the management of a modern imaging department. Prof. Gishen outlined the advantages of having a managed service or external refreshment programme for leasing and acquiring all imaging equipment, so that radiologists were spared the constant treadmill of writing business cases, seeking approval, getting money for and choosing new imaging equipment. A managed purchase agreement with a single company ensures approximate state of the art of all equipment used in the department, with scheduled refreshes and upgrades, and repairs and installations all built into the service. Radiologists can then concentrate upon their prime function: imaging itself!

Professors Frija and Lim advised us that the most modern equipment is essential, although Prof. Pentecost cautioned never to buy "Version 1.0" but always to wait a little while to assess the marketplaces (and wait for bugged equipment malfunction to manifest itself!). ❄

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PAY-FOR-PERFORMANCE IN AMERICAN MEDICINE

A Real Solution to the Ills of Healthcare?

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Pay-for-performance in medicine is rooted in a very simple and easy-to-grasp concept: create a financial incentive for physicians and you will see an improvement in the quality and efficiency of healthcare. Barely five years old, pay-for-performance strategies abound across the United States, welcomed by hospitals, physicians and employers as well as large corporations. The media and other leaders are preaching it as a solution to the ills of healthcare.

But does pay-for-performance (P4P) offer a realistic means for improving quality and efficiency in healthcare? Doubts remain about whether this system will actually positively impact quality. The current metrics of pay-for-performance are, by any standard, rudimentary – basic enough to raise doubts about their real impact and the long-term buy-in by physicians and hospitals. And are radiologists really in a position to help the development of these standards to ensure that this system is an equitable one with long-term reach? This article explores the fundamental issues further.

History of P4P

In response to the 1999 Institute of Medicine report about the state of quality in American medicine, companies such as General Electric, IBM, General Motors, and Boeing launched the Leapfrog Group with the aim of disseminating information about quality and creating a payment mechanism that rewarded value and efficiency. The Leapfrog Group settled on three standards for judging hospitals: computerised physician order entry, full-time intensivist staffing of intensive care units, and referral to hospitals with high-volume surgical practices. Hospital compliance with these voluntary standards is published annually in the group's Hospital Quality and Safety Survey.

A second major project began in 2003, when Premier, Inc., a medical centre purchasing alliance, partnered with Medicare in a pilot project following patients with myocardial infarction, knee and hip replacement, congestive heart failure, community-acquired pneumonia, and coronary artery bypass surgery. This project aimed to improve quality in healthcare.

Premier, Inc.'s Hospital Quality Incentive Demonstration (HQID) programme, which began in October 2003 in 260 hospitals, using 33 quality measures in five clinical conditions allowed for plus/minus 2% in Medicare payments. For the first time, there was a concrete incentive for participation. Hospitals in the top 10% will receive an additional 2% in payments, the second 10% will earn an extra 1%, and the lowest 10% can be docked as much as 2%.

Bridges to Excellence, originated by General Electric in 2003, goes one step further by creating a financial bonus system for physicians caring for patients with diabetes and heart disease. By adhering to National Committee for Quality Assurance guidelines, a physician can earn 80 dollars for diabetic patients and 160 dollars for heart patients per year.

However, on February 1, 2005, Dr. Mark McClellan, the Director of the Centres for Medicare and Medicaid Services, announced that ten physician groups would be enrolled in a pay-for-performance trial, dubbed the Medicare Physician Group. Dr. McClellan has estimated that, by 2012, 20 - 30% of federal provider payments will be made on the basis of pay-for-performance, a resounding endorsement for the system.

Pitfalls of P4P

The worries about pay-for-performance are growing. For example, the new Medicare Physician Group Practice Demonstration proposes paying physicians more for better results in treating patients with congestive heart failure, asthma, diabetes, depression, and other conditions. In the descriptions of the individual project goals, much emphasis is placed on collaborative care. Why then is no mention made about compensating other members of the healthcare team? In a profession in which teamwork is the cornerstone, how will this be justified and how will this impact the morale of colleagues?

Also, most physicians practice at more than one hospital, and nearly all participate in multiple insurance plans. If each pay-for-performance programme necessitates an incompatible information system, this could pose an insurmountable burden, particularly on small practices. Further, the very hospitals struggling to keep up with information system investments and human resource needs may be the ones receiving less compensation.

In addition, computerised physician order entry and intensivist staffing are expensive, and without tangible returns, hospital executives were reluctant to invest in these programmes. It is simply unrealistic to expect that low-volume surgical hospitals are going to answer a survey that recommends diverting their patients to higher volume facilities.

Additional Pitfalls Pose Problems

Socioeconomic status means that the poor are much more likely to have lower baseline scores on measures such as breast, cervical and colorectal cancer screening, hypertension control and immunisation rates. How then will these populations meet the targets of most pay-for-performance programmes? Is it fair to financially punish the physicians and hospitals who care for these patients?

Also, in the Hospital Compare database, facilities are compared based on the time between the diagnosis of pneumonia and the initiation of antibiotic therapy. Who makes the call on the diagnosis of pneumonia? The paramedic? Senior resident? Attending? Does someone in the emergency room trigger a stop watch? And what about patients with other infections. Will hospitals shortchange other patients in their race to meet targets? Clearly, there remain significant holes in the P4P proposition.

Conclusion: Is P4P the Answer?

The arguments for pay-for-performance are persuasive, and as with any process, determining whether or not the pros outweigh the cons can only be an ongoing process. But many outputs of the healthcare industry are difficult to define, much less measure. P4P programmes have the potential to reward radiologists not only with direct bonuses, but through increased referrals from primary care physicians who may need to order tests to meet their own P4P criteria. However, it is unclear how P4P will evolve in the next few years or even how it will impact healthcare in the long term. ❊

RUNNING A TELERADIOLOGY BUSINESS

Practical Issues and Challenges

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Eurad Consult is a provider of diagnostic radiology reporting services with an output of over 40,000 MRI reports per year. Our remote reporting services provide continuity in radiology departments within optimal turnaround times. However, teleradiology still poses operational challenges for our company that are not helped by a lack of harmonised EU regulations, and the challenges of data security, technological integration and quality assurance, the solutions to which will be explored further in this article.

Firstly, let me summarise how our company structures its services. Every report is subject to a double reading. This means that at least two radiology experts have to agree on the contents of each report, before it goes to the next step. Then the following steps are in place to ensure the best result possible:

- Discrepancy scores are given for each report and evaluated in monthly reports;
- Top linguistic editing of every report by professional native speakers;
- Full compliance with the most strict security and privacy legislation in force in each respective country;
- Full liability insurance;
- Monthly reviews of customer quality reports, and
- Permanent on-site operational IT assistance.

Since each of our radiology experts analyses thousands of images per year, they develop very specific knowledge that offers a high level of expertise for any subspecialty required. A full-time radiologist can produce as many as 10,000 MRI reports per annum. All our radiology experts possess the necessary licences in line with local legislation and their qualifications are EU registered and accredited.

Quality Assurance

Eurad Consult has developed and implemented our own quality process, where every step of the procedure is professionally monitored and validated. Our "central reading model" includes:

- All our top radiologists have undergone proper training, credentialing and accreditation;
- Registration in the country of service delivery;
- Dedicated reading centres are mainly used because de-localised diagnostic reading sessions "at home" would not allow the same physical quality process;
- Appointment of a Medical Director (Chief Radiologist); and
- Periodic supervision by the Eurad Medical Advisory Board, periodic external audits and daily internal quality monitoring.

Challenges in Workflow Management

Service delivery processes in teleradiology are not without glitches. Each of our services is broken down into several key process flows that allow us to monitor each part of the chain from the reception of the information, to the primary read, to SLA reporting and, finally, billing. Each of these is subject to validation to ensure completeness and consistency of information from first receipt of the set of images to be reported on, after which clinical information is input, to the reporting process where we must ensure medical and language consistency in a timely turnaround window. We must also report on any discrepancies and send a quality report to the customer.

Problems crop up during this process. For example, insufficient visibility on images received, loss of images or electronic requests, inconsistencies between images and requests or problems of a technical nature such as limited integration of clinical information with no HL7 link. The solution has been provided by the use of business intelligence software for automated validation checks. The goals of these are improved data control, efficiency gains and improved communication.

We can therefore create a daily operational report that looks at, for example, what is missing, from which hospital and for which study. These validation checks allow faster detection and retrieval of incomplete studies, decreased overall turnaround time and increased customer

Author *Guidelines*

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CONTENT

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Thank you,
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satisfaction due to quicker results. For the radiologist, it ensures there are no incomplete studies in the work list and for our administration there is a natural shift to quality monitoring instead of running around putting out fires.

RIS-PACS Integration a Further Challenge

The advent of RIS-PACS has brought more efficient imaging services. As well as improved integrity of clinical information and decreased turnaround times, e.g. for CR: from 20 to 30/35 rep./h (>50%), it allows better clinical governance, including an improved over-reading and discrepancy grading system, the easy availability of previous exams and increased satisfaction for radiologists, customers and administrative staff.

Challenges posed by service level agreement reporting (SLAs) such as lack of manpower to track input data for quality reporting, and turnaround time of reports, were also overcome through the automation of SLA reporting and billing processes based on business intelligence. The goals were automated data tracking, tracking of the number of validated reports, improved turnaround time and the ability to view discrepancy grades resulting from the double reading process. Finally, the billing system was greatly improved with invoicing of patient details in electronic format, enabling us to answer questions about correct invoicing of exams.

Security a Key Priority

It goes without saying that teleradiology service providers should ensure the utmost security and privacy of transmitted patient data. In the UK, this is covered by the Data Protection Act 1998 and at an EU level, directive 95/46/EC ensures an adequate level of protection for the rights and freedoms of data subjects in relation to the processing of personal data. Problems arise due to the fact that data storage space is limited and exams are automatically removed when storage capacity limits are reached.

We operate a "First-In, First-Out" principle that guarantees that data storage lasts from three to six months. This means that even though the time necessary for clinical diagnosis is a mere 24 hours, the response time for any additional questions from referring clinicians is a maximum of six months. Ensuring data confidentiality is also a priority. We use a VPN and secure email to guarantee this. For data integrity we use DICOM standards and lossless compression. We also provide a facility for the receiver to prove that the sender did in fact send the data, as well as "secure collaboration solutions" for tracking and non-repudiation of file modifications.

Clinical Governance a Key Challenge

There is no doubt that good clinical governance in teleradiology is of primary importance. Internal audits and self-assessment should become part of the normal workflow. Clinical governance covers the areas of:

- Strategic Capacity and Capability – Planning, communication and governance arrangements, and cultural behaviour aspects.
- Risk Management – Incident reporting, prevention and control of risk.
- Staff Management and Performance – Recruitment, workforce planning, appraisals.
- Education, Training and Continuous Professional Development – Professional re-validation, management development, confidentiality and data protection.
- Information Management – Patient records, etc.
- Communication – Patient and public, external partners, internal, board and organisation-wide.

EU Must Lead the Way

Current ESR Guidelines exist in the fields of registration and education/revalidation but this is not yet supported by any EU-wide requirement, with different regulations in Member States confusing the matter. There is a need for reinforcement at a European level to provide uniform regulations for registration, accreditation and re-validation. According to the guidelines, all radiologists have to be subject to the regulations in the country of each patient's residence. However, the challenge is how to fulfil requirements for each country where services are delivered.

This was discussed in the EU Healthcare Professionals Crossing Borders Agreement, 2005, which was implemented by the end of 2007 and includes a "European Template for a Certificate of Current Professional Status". This would cover teleradiologists registered in another EU Member State, who should be required to provide such a European Certificate from his/her Medical Regulatory Body before obtaining registration in another EU Member State. ❄

CHAIRMAN DURING THE GADODIAMIDE/NSF COVER-UP

When Adverse Event Reporting Becomes a Nightmare

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March 21, 2006, two colleagues from the department of nephrology entered my office. "We have the evidence. The use of gadodiamide impairs our patients" were the heart-stopping words. On the Excel spread-sheet before me lay clear evidence that the only common drug given to all the patients who had developed nephrogenic systemic fibrosis (NSF) was gadodiamide. Now, it is said that there are more victims of gadodiamide than after Vioxx before it was withdrawn from the market. Here, I share some of the events that led to a final ban by European authorities on the use of gadodiamide-based contrast-enhanced MRI scans on patients with impaired renal function.

Since the summer of 2005, there were whispers at our hospital of problems with the contrast agent used in the MR centre. Many patients complained of a bad taste after the injection of gadodiamide. However, our systematic analyses showed that there was no room for doubt: gadodiamide was toxic to certain patients.

The vendor, GE Healthcare, had not informed us about this delayed adverse reaction, despite their official stance that they were active in collecting information about adverse reactions to all their products on an international level. Awaiting a response to a letter I circulated to members of the Contrast Media Safety Committee of the European Society of Urogenital Radiology (ESUR), and without any external authority providing guidance, we ceased all enhanced MRI exams in patients with reduced renal function. A few days later, Dr. Grobner from Austria informed me that they had also used gadodiamide and in January 2006 published a case report where five out nine patients on haemodialysis developed NSF after exposure to gadolinium. March 30, 2006, the Danish Medicines Agency was informed about our observations.

Where was the Vendor Through all of this?

Studying the literature revealed that from the end of the Eighties gadodiamide was known to have proven stability problems; the ability of the ligand to hold the toxic gadolinium ion was significantly lower than that of most other gadolinium-based contrast agents both in vitro and in vivo. Why had the vendor never told us that? Almost five months later GE finally offered to sponsor a review of the patients concerned, but not an unconditional one. This proposal was clearly ethically questionable. We decided within four weeks to change to another macrocyclic agent in all patients.

Around June 1, 2006, the Health Authorities released a warning about NSF while the vendor released a 'Dear Health Professional' letter in the US, though not in Europe, a cautious statement that there 'might' be a problem. This issue is under scrutiny presently, at a Jacksonville, Florida court where GE is now accused of negligence. At congresses, GE continued to announce that gadodiamide was a safe drug despite the 'Dear Health Professional' letter. How could I go further with my investigation to ensure patient safety?

Reports Flood in About Adverse Reactions

Mid-August I sent an email to all the members of ESUR asking whether they had heard about NSF. The advantage of ESUR is that it has members all over the world. The response was worrying. Within two weeks I had received reports about 150 cases of NSF after exposure to gadolinium contrast agents. I contacted the respondents and asked which contrast agent they used, independent of whether they had said "no cases" or "yes, we had cases". In 95% of the cases, gadodiamide was the agent used.

I contacted the Editor-in-chief of European Radiology, Prof. Albert Baert. He agreed that it was an important message that needed to be published as soon as possible and within six weeks my editorial was available on the internet – the first warning in a radiological journal. Meanwhile, our analysis confirmed our initial conclusion that macrocyclic agents were preferable with regards to stability. We found it unethical to continue gadodiamide in all patients.

Reinstating a Safer MRI Exam

We could not continue diminishing access to enhanced MRI exams for end-stage renal failure patients. After a medical technology assessment where we evaluated the alternatives, we commenced again with MRI. Factors that were included in the assessment were:

- Diagnostic quality (worse, equal or better to enhanced MRI);
- Procedural complications;
- Morbidity and mortality of haemodialyses in untrained patients;
- Acute non-renal adverse reactions;
- Acute renal adverse reactions, and
- Delayed reactions.

In most instances we concluded the risk from an alternative exam outweighed the risk of NSF after exposure to a macrocyclic agent in MRI doses. We still discuss whether it was beneficial to do peripheral arteriography as a pretransplant exam despite having shown that we found silent vascular stenosis in about 5% of these patients.

In Denmark, Omniscan was approved for general MRI of the whole body in doses up to 0.3 mmol/kg, also in patients with CKD 5 (< 15 ml/min) including dialysis. There was no warning in the SPC until February 7, 2007, when the EMEA decided that it was contraindicated to use Omniscan in patients with a GFR below 30 ml/min. The local situation had been settled within three to four months. Since we reintroduced this type of MRI exam, we have not seen a single case of NSF.

International Colleagues Weigh In

Increasing numbers of international colleagues confirmed that they had seen nephrogenic systemic fibrosis in patients with end-stage renal failure after exposure to gadolinium-based contrast agents, in particularly gadodiamide. With time, we also found more cases

> **"Specialists had warned the company about bringing gadodiamide to market. It was not for human use"**

(August 1, 2007: 27 further cases after gadodiamide). Cases with other products were also reported. As of August 1, 2007, a total of 123 cases of NSF where authors have looked at the gadolinium exposure have been

documented. 118 of these cases had gadodiamide as a triggering agent. It substantiates our findings. After we reintroduced enhanced MRI with a macrocyclic agent we have not seen a single case of NSF.

Why the Smokescreen?

The burden of investigating this event was left to concerned Chairpersons such as myself. The consequence of taking such a stand against worldwide entities, however, was the negative feedback I experienced. I get invitations to lecture at many institutions. A common response was how late radiologists became aware of the problem. They felt someone tried to diminish the problem.

Recommendations are Recognised

During this time, the European authorities instituted a ban on the use of gadodiamide in patients with reduced renal function; exactly what I had recommended in a paper that was labeled as 'misleading to health professionals' by industry executives. Also at this time, rumours came out that specialists had warned the company about bringing gadodiamide to market. It was not for human use. Surprisingly, this was confirmed at the NSF session at the international congress of MRI in Berlin. In February 2007, the European Authorities contraindicated the use of gadodiamide in patients with reduced renal function. At last, we had official recognition of our observations.

Conclusion

We hear much about 'corporate ethics' in press releases and through the media. But a commercial company will always look at their balance sheet in these considerations, which leads me to quote George Orwell, as follows: "**In a time of universal deceit, telling the truth is a revolutionary act**". ❄

Outsourcing and Radiology

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Outsourcing is a very important factor in our economy today. Modern companies know that for their non-core competencies, they need to seek specialists. Outsourcing delegates the non-core operations from internal production to an external entity specialising in that particular operation. It is part of the economic world since the 1980s. In healthcare, however, it is more or less known of for just the past ten years, and not yet common currency.

Outsourcing and Radiology

Outsourcing in hospitals is becoming more and more popular. The most common services that are outsourced are non-medical tertiary services that include catering, cleaning, laundry, logistics, technical facility management, etc. In recent years, however, hospitals have started to outsource medical services, so-called "secondary services", which include laboratory, pathology as well as radiology services. Some hospitals have even outsourced entire service lines such as cancer centres, outpatient surgery or ophthalmology. Structured and operated effectively, outsourcing can produce significant benefits while enabling hospitals to focus limited resources and management efforts on other areas.

What is Outsourcing?
Outsourcing involves the transfer of the management and/or day-to-day execution of an entire business function to an external service provider. The client organisation and the supplier enter into a contractual agreement that defines the transferred services. Under the agreement, the supplier acquires the means of production in the form of a transfer of people, assets and other resources from the client. Organisations that outsource are seeking to realise benefits such as cost savings, cost restructuring, and improved quality.

Radiology is increasingly being considered for outsourcing due to its unique operating and funding challenges and because of interest expressed by radiologists and outside vendors. The challenge of responding to constant technological advancement, labour shortages, and increasing customer service expectations in the face of declining reimbursement, managed care, capital constraints, and outpatient competition are compelling hospitals to consider outsourcing. Moreover, the daunting financial and operational challenge of transitioning radiology from an analogue world to a digital one makes management and funding of radiology even more of a challenge for hospitals.

Radiology outsourcing arrangements can be tremendous win-win opportunities for radiologists and hospitals; they are very significant undertakings and should be entered into only with realistic goals, commitment, due diligence, and confidence by both parties.

Advantages to Radiologists of Outsourcing

Outsourcing the radiology department to radiologists capable of effectively managing technical operations offers multiple potential advantages. The structure and the terms of the arrangement will influence which advantages apply and the magnitude of the benefits. Advantages to radiologists include; a share in technical profits; greater security with the hospital; enhanced autonomy and authority to manage technical operations; increased discretion over technical staff and systems, which can in turn improve professional productivity and service; the ability to operate without hospital operating and capital constraints; opportunities for management compensation; and the freedom to create more competitive outpatient services.

Potential Models

Regarding radiology, there are several models for structuring an outsourcing arrangement. The appropriate model will depend on the organisation's financial, operational, and political dynamics and on the specific goals. Common models are:

Management contract: Radiologists have an agreement with delineated management responsibility and authority while the hospital retains ownership and employees. Radiologists are compensated on a management fee basis with or without additional performance targets and incentives.

Management contract with financial risk: Radiologists have a management contract that involves some degree of risk if financial and/or quality and service indicators are not met.

Leased department: Radiologists enter into an arrangement to provide the entire technical radiology operation, including employees, rent, supplies, billing agent, and marketing. However, the department must still be integrated with and operated within hospital licensure and regulatory requirements. This model may or may not include technical asset or facility ownership through an additional agreement.

Joint venture: Radiologists and the hospital enter into a joint venture to own and operate some component or all of the technical radiology services within and potentially outside the hospital. Radiologists have a separate agreement with the joint venture for management of technical services. It may include a third party for financing and other services.

Sale of department: Radiologists purchase the assets and ongoing business of the radiology technical operation from the hospital and provide the service on a contractual basis.

Will Nighthawking Erode Profession?

24/7 radiologist coverage is increasingly demanded by many hospitals and healthcare systems. The difficult task with regard to establishing this goal is to offer a full-range service during the night. Once a radiologist did not have to be in the same building as the physician requesting a read, it was only a matter of time before these colleagues no longer had to be on the same continent. Some call this practice "nighthawking," and one of the largest US-based companies offering such services is NightHawk Radiology. The company says more than 500 US hospitals now rely on its 35 radiologists — US-born and trained — in Australia and Switzerland.

Radiologists may employ this technology for their own purposes, but they have to consider that such technology could one day be their complete undoing. There is a danger that teleradiology could reduce radiologists to the status of a technician. Radiologists can use overseas evening radiology coverage services to provide continuous interpretations to lessen their call burden. These services provide quality exam interpretations, either preliminary or final, while the home radiologists sleep. That alone is not a threat. But these services can provide their readings at a significantly lower cost than that of the home radiology group. Not only are these readings less costly, but current evidence is that costs are continuing to decrease as the number of suppliers in the market increases.

Despite this, the potential advantages of outsourcing for hospitals include the ability to:

- Shift or share risk for financial performance with the radiologists;
- Align incentives for improved quality, service, and financial performance;
- Effect greater expertise and more focused management of radiology while freeing limited hospital management time and resources;
- Attract outside sources of capital for the growing cost of radiology equipment and staff;
- Improve billing and compliance;
- Develop or consolidate outpatient services with radiologists to enhance growth, competitiveness, and cost-effectiveness and,
- Eliminate redundant overhead by operating radiology as a single business unit rather than separate organisations.

Conclusion

Outsourcing radiology can offer true advantages if the parties involved are committed and capable and if win-win opportunities exist. Significant preparation and research is strongly recommended prior to entering into such an arrangement in order to identify the potential value to the parties involved, assess the risks and requirements, and ensure that the parties are capable of delivering on their responsibilities and intended results. There are several possible models for structuring an outsourcing arrangement.

Institutions interested in an outsourcing arrangement must choose the model that best fits their needs and goals of the parties involved. Outsourcing is not something to be tried at home unless both parties are prepared for and capable of managing the substantial change and challenges associated with such a significant undertaking. The use of teleradiology, including outsourcing, is likely to improve on-call productivity, but worries remain with regard to its potential effect on patient care. ❇

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Product Comparison Chart

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ECRI Institute's focus is medical device technology, healthcare risk and quality management, and health technology assessment. It provides information services and technical assistance to more than 5,000 hospitals, healthcare organisations, ministries of health, government and planning agencies, voluntary sector organisations and accrediting agencies worldwide. Its databases (over 30), publications, information services and technical assistance services set the standard for the healthcare community.

More than 5,000 healthcare organisations worldwide rely on ECRI Institute's expertise in patient safety improvement, risk and quality management, healthcare processes, devices, procedures and drug technology. ECRI Institute is one of only a handful of organisations designated as both a Collaborating Centre of the World Health Organisation and an evidence-based practice centre by the US Agency for healthcare research and quality.

For more information, visit www.ecri.org

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SUPPLIER	ECRI INSTITUTE'S RECOMMENDED SPECIFICATIONS [1]	
MODEL	**Radiography**	
FDA CLEARANCE		
CE MARK (MDD)		
DICOM COMPATIBLE	Yes	
MODALITIES	Any grayscale radiographic image	
PROCESSING METHOD	Dry	
INPUT PORTS, no.	1 to 6 (networked)	
PIXELS (maximum)	2000 x 2000	
SPATIAL RESOLUTION, pixels/mm	12.2 pixels/mm	
CONTRAST RESOLUTION, shades of gray	4,096 shades of gray	
INTERNAL MODULATION, bits	12	
FORMATS	Up to 16	
THROUGHPUT, films/hr	100	
MULTIPLE ORIGINALS	99	
HARD-DRIVE STORAGE		
RAM, MB	256	
FILM		
Film sizes, cm (in)		
Company film brand		
INTERFACE OPTIONS	DICOM (TCP/IP)	
KEYPAD FUNCTIONS	Yes	
REMOTE DIAGNOSTICS	Yes	
CALIBRATION METHOD	Automatic/manual	
L x W x H, cm (in)	Stand-alone	
WEIGHT, kg (lb)		
POWER REQUIREMENTS	Standard	
PURCHASE INFORMATION		
List price		
Warranty	1 year	
Year first sold		
Fiscal year		
OTHER SPECIFICATIONS		

Footnotes to the Product Comparison Chart
1 These recommendations are the opinions of ECRI Institute's technology experts. ECRI Institute assumes no liability for decisions made based on this data.
2 Also used in ophthalmology, physician reports, networks, and PACS.
3 Ethernet and parallel input ports; 32 concurrent Ethernet connections.
4 Also 2400 x 2680 pixels, A-size media.
5 Dye diffusion. 6 - A, A4 for paper.
7 Optional DICOM 3.0, DEFF, and video.
8 Also imager configuration, including image quality, interface configuration, media, and film-low/film-out messaging.

Publication of all submitted data is not possible: for further information please contact ECRI or editorial@imagingmanagement.org.

AGFA HealthCare	AGFA HealthCare	AGFA HealthCare	AGFA HealthCare	CODONICS
DRYSTAR 5300	**DRYSTAR 5302**	**DRYSTAR AXYS**	**DRYSTAR 5503**	**HORIZON Ci Multi-Media Dry Imager**
Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Optional
Multiple medical imaging modalities, including CT, MRI, CR, DR, US, NM, C-arm, cardiac, vascular, digital	Multiple medical imaging modalities, especially CT, MRI, CR, DR, US, NM, Carm, cardiac, vascular, digital	Multiple medical imaging modalities, especially CT, MRI, CR, DR, US, NM, C-arm, cardiac, vascular, including mammography	Multiple medical imaging modalities, especially CT, MRI, CR, DR, US, NM, Carm, cardiac, vascular, including mammography	CT, MRI, DSA, DR, NM, US, mammography, PACS, oncology, fluoroscopy, workstation
Direct digital	Direct digital	Direct digital	Direct digital	Dry
DICOM	DICOM	DICOM	DICOM	Ethernet
diagnostic area: 4256 x 5174 (14 x 17 in)	diagnostic area: 4358 x 5232 (14 x 17 in)	diagnostic area: 6922 x 8368 (14 x 17 in)	diagnostic area: 6922 x 8368 (14 x 17 in)	300 dpi, 2280 x 2565, 8 x 10" film [4]
320 ppi	320 ppi	508 ppi	508 ppi	126; 320 ppi
4,096	4,096	16,384	4,096	4,097 gray levels
12	12	14	12	12
DICOM defined	DICOM defined	DICOM defined	DICOM defined	Any combination; most common are 1, 2, 4, 6, 8, 9, 12, 15, 20, 24; also 35 mm slide maker
100 (11 x 14 in), 70 (14 x 17 in)	140 (8 x 10 in), 75 (14 x 17 in)	130 (8 x 10 in), 75 (14 x 17 in)	160 (8 x 10 in), 104 (14 x 17 in)	Up to 75
Not specified	Not specified	Not specified	Not specified	100
Not specified	72 GB	72 GB	72 GB	10 GB
512 MB or 1024MB	512 MB	512 MB	512 MB	256
35 x 43 (14 x 17), 28 x 35 (11 x 14)	20 x 25 (8 x 10), 26 x 30 (10 x 12), 28 x 35 (11 x 14), 35 x 35 (14 x 14 in), 35 x 43 (14 x 17 in)	20 x 25 (8 x 10), 26 x 30 (10 x 12), 28 x 35 (11 x 14), 35 x 35 (14 x 14 in), 35 x 43 (14 x 17 in)	20 x 25 (8 x 10), 26 x 30 (10 x 12), 28 x 35 (11 x 14), 35 x 35 (14 x 14 in), 35 x 43 (14 x 17 in)	20 x 25 (8 x 10), 35 x 43 (14 x 17) for film [6]
DRYSTAR DT2 (blue and clear)	DRYSTAR DT2 (blue and clear)	DRYSTAR DT2 (blue and clear) & DRYSTAR DT2 Mammo	DRYSTAR DT2 (blue and clear) & DRYSTAR DT2 Mammo	Direct Vista Media
Direct DICOM, video and digital via Paxport	Direct DICOM, video or digital via Linx Paxport	Direct DICOM, video or digital via Linx Paxport	Direct DICOM, video or digital via Linx Paxport	DICOM, PostScript, Microsoft Windows, network printing, FTP, LPR, video, laser-camera emulation
All operator, key operator, service mode functions	All operator, key operator, service mode functions	All operator, key operator, service mode functions	All operator, key operator, service mode functions	Power, supply status (loaded media and sheets-remaining count), imager status messages, error messages, on-line help, imager utilities, test prints, queue control, calibration [8]
Yes	Yes	Yes	Yes	Via modem or network
Automatic or manual	Automatic or manual	Automatic or manual	Automatic or manual	Built-in densitometer for film, built-in electronics for thermal print head
70 x 80 x 35 (27.5 x 31.5 x 13.8)	72,8 x 71,5 x 67,6 (28,7 x 28,2 x 26,6)	72,8 x 71,5 x 67,6 (28,7 x 28,2 x 26,6)	71,5 x 72 x 141 (28.1 x 28.3 x 55.5)	60 x 52 x 37 (24 x 20.5 x 14.5)
55 (121)	90 (198)	90 (198)	193 (425)	35.8 (79)
100-240 VAC, 50/60 Hz	100-240 VAC, 50/60 Hz	100-240 VAC, 50/60 Hz	100-240 VAC, 50/60 Hz	100-120/230 VAC, 50/60 Hz; 600 W printing, 150 W idle
				$32,995
1 year	1 year	1 year	1 year	1 year
2004	2005	2007	2006	2002
				January to December
None specified.	2 media supply drawers for any-size media; short time to first printed sheet	2 media supply drawers for any-size media; short time to first printed sheet	3 media supply drawers for any-size media; built-in sorter (4-bin); short time to first printed sheet	Does 8 x 10" and 14 x 17" film with no operator intervention to switch between grayscale and color; ImageSense for automatic image-type recognition; bracket printing for image quality adjustment; smartcard and Zip disk for configuration storage; 24 hr replacement service guaranteed.

Product Comparison Chart

SUPPLIER	ECRI INSTITUTE'S RECOMMENDED SPECIFICATIONS [1]	CODONICS	CODONICS	CODONICS
MODEL	Radiography	**HORIZON GS Multi-Media Dry Imager**	**NP-1600M Medical Color Printer**	**NP-1660M Diagnostic Medical Printer**
FDA CLEARANCE		Yes	Yes	Yes
CE MARK (MDD)		Yes	Not specified	Not specified
DICOM COMPATIBLE	Yes	Optional	Optional	Optional
MODALITIES	Any grayscale radiographic image	CT, MRI, DSA, DR, NM, US, mammography, PACS, oncology, fluoroscopy, workstation	CT, MRI, DSA, DR, NM, US, CR, radiation therapy, bone densitometry, cardiology workstations [2]	CT, MRI, DSA, DR, NM, US, CR, radiation therapy, bone densitometry, cardiology workstations [2]
PROCESSING METHOD	Dry	Dry	Dry	Dry
INPUT PORTS, no.	1 to 6 (networked)	Ethernet	See footnote 3	See footnote 3
PIXELS (maximum)	2000 x 2000	300 dpi, 2280 x 2565, 8 x 10" film [4]	2400 x 2680, A-size media	2400 x 2680, A-size media; 2280 x 2565, 8 x 10" film
SPATIAL RESOLUTION, pixels/mm	12.2 pixels/mm	126; 320 ppi	118; 300 ppi	118; 300 ppi
CONTRAST RESOLUTION, shades of gray	4,096 shades of gray	4,097 gray levels, 16.7 million colors	256 gray levels, 16.7 million colors	256 gray levels, 16.7 million colors
INTERNAL MODULATION, bits	12	12	8	8
FORMATS	Up to 16	Any combination; most common are 1, 2, 4, 6, 8, 9, 12, 15, 20, 24; also 35 mm slide maker	1 x 1 through 9 x 9 in any combination; 35 mm slide, customized	1 x 1 through 9 x 9 in any combination; 35 mm slide, customized
THROUGHPUT, films/hr	100	Up to 75	50, paper; 36, transparency [5]	50, paper; 50, film; 36, transparency [5]
MULTIPLE ORIGINALS	99	100	100	100
HARD-DRIVE STORAGE		10 GB	2.1 GB	2.1 GB
RAM, MB	256	256	96; 32 MB RAM, 64 MB virtual	96; 32 MB RAM, 64 MB virtual
FILM				
Film sizes, cm (in)		20 x 25 (8 x 10), 35 x 43 (14 x 17) for film [6]	A, A4, Long-A, Long-A4, Xlong-A, Xlong-A4	7 sizes from 8 x 10" to 8.5 x 14"
Company film brand		Chroma Vista Media, Direct Vista Media	Chroma Vista Media	Direct Vista Media, Chroma Vista Media
INTERFACE OPTIONS	DICOM (TCP/IP)	DICOM, PostScript, Microsoft Windows, network printing, FTP, LPR, video, laser-camera emulation	Ethernet (AUI ISpin connector, 100BaseT/10BaseT, RJ45 connector), parallel [7]	Ethernet (AUI ISpin connector, 100BaseT/10BaseT RJ45 connector), parallel [7]
KEYPAD FUNCTIONS	Yes	Power, supply status (loaded media and sheets-remaining count), imager status messages, error messages, online help, imager utilities, test prints, queue control, calibration [8]	Interface configuration, color management, option and feature selection	Interface configuration, color management, option and feature selection
REMOTE DIAGNOSTICS	Yes	Via modem or network	Via Ethernet	Via Ethernet
CALIBRATION METHOD	Automatic/manual	Built-in densitometer for film, built-in electronics for thermal print head	Preset, adjustable	Preset, adjustable
L x W x H, cm (in)	Stand-alone	60 x 52 x 37 (24 x 20.5 x 14.5)	53.3 x 43.2 x 30.5 (21 x 17 x 12)	53.3 x 43.2 x 30.5 (21 x 17 x 12)
WEIGHT, kg (lb)		35.8 (79)	27 (60)	27 (60)
POWER REQUIREMENTS	Standard	100-120/230 VAC, 50/60 Hz; 600 W printing, 150 W idle	90-264 VAC, 250 W, 47-63 Hz, autosensing	90-264 VAC, 250 W, 47-63 Hz, autosensing
PURCHASE INFORMATION				
List price		$29,995	$10,995	$12,995
Warranty	1 year	1 year	1 year	1 year
Year first sold		2002	1994	1997
Fiscal year		January to December	January to December	January to December
OTHER SPECIFICATIONS		Does 8 x 10" and 14 x 17" film with no operator intervention to switch between grayscale and color; ImageSense for automatic image-type recognition; bracket printing for image quality adjustment; smartcard and Zip disk for configuration storage; 24 hr replacement service guaranteed.	Recognizes TIFF, GIF, PCX, BMP, PBM, PGM, PPM, XWD, JPEG, Sun Raster, SGI, RGB, TARGA, and PostScript formats; built-in floppy drive; optional MO drive; connectivity (analog input); 5150 MHz pixel clock via Codonics SA-1000 image framegrabber.	Recognizes TIFF, GIF, PCX, BMP, PBM, PGM, PPM, XWD, JPEG, Sun Raster, SGI, RGB, TARGA, and PostScript formats; built-in floppy drive; optional MO drive; connectivity (analog input); 5150 MHz pixel clock via Codonics SA-1000 image framegrabber.

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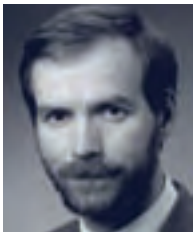
SETTING UP A NATIONAL BREAST SCREENING PROGRAMME

Lessons Learned

In June 2002, the German Bundestag decided to introduce a demographically-based national mammographic screening programme of all women between the ages of 50 and 69. This article highlights the management challenges that were experienced during the planning, implementation and evaluation of the programme.



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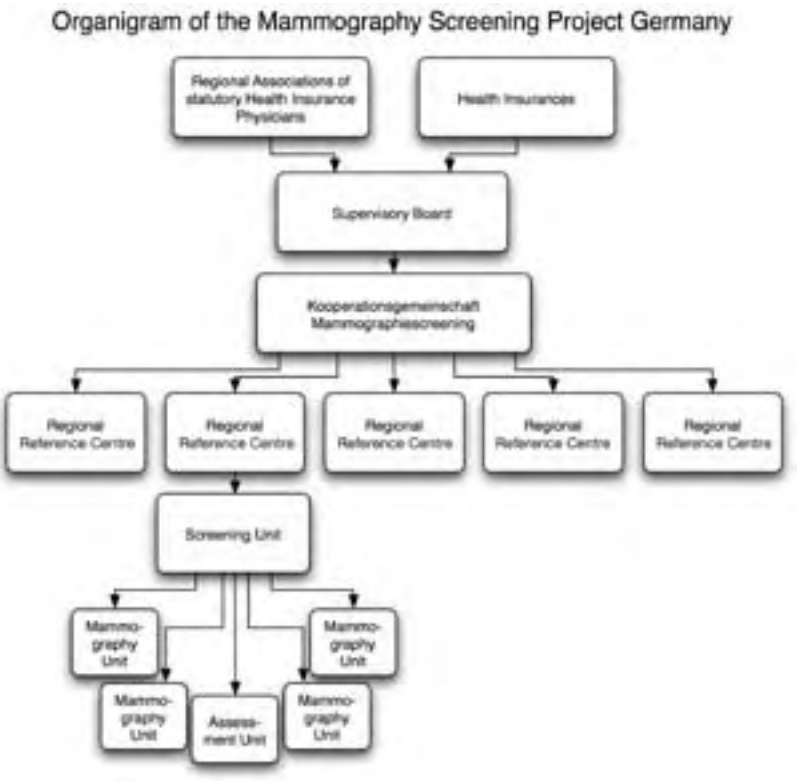
In January 2004, the "Guidelines for the Early Detection of Cancer" (Krebsfrüherkennungs-Richtlinie) and the "Contract Between Physicians and Health Insurance Companies" (Bundesmantelvertrag für Ärzte und Kranken- bzw. Ersatzkassen) defined a new programme that planned to reduce mortality from breast cancer by up to 30% via early stage detection, similar to established programmes in the Netherlands, the United Kingdom, Sweden, Denmark and Norway. Its success is dependent on its ability to achieve a high quality of imaging, reporting and administration as well as a high participation rate, i.e. more than 65 to 70% of the population on a voluntary basis.

To guarantee the necessary high quality in imaging and reporting, reference centres have been founded to inform, educate and control the quality of 92 involved screening units who are each responsible for about 125,000 women in their districts. Therefore, all radiographers, reporting physicians and involved physicians have to participate in well-defined educational courses and must stay at least one to four weeks in a reference centre to learn about screening background and handling, organisational work and quality assurance mechanisms.

The "Kooperationsgemeinschaft Mammographie" was founded both by the insurance companies and the "Regional Association of Statutory Health Insurance Physicians" (Kassenärztliche Vereinigung), as the highest organisational authority for all people and facilities that work in the programme. Each person and facility has to be accredited by a formal procedure.

How is the Screening Process Run?

During the process of mammographic screening (see related graph) the residents' registration offices send the following



information to the regional institution responsible for invitations or "Einladende Stelle": first names, last names, former last names, address and birth date. The regional institution will generate a unique code from those data and will send an invitation to the nearest mammography unit for a screening according to parameters set by the screening unit. Typically those invitations are sent out about three to four weeks before the appointment will take place. The woman can now decide to attend or not to attend, at the specifically-mentioned date or at another date.

Once the woman arrives at the mammography unit, she is announced and asked about previous diseases or operations of the breast. After, the physical exam takes place and the woman is x-rayed on both sides of her breast. After the procedure, she leaves the unit. All data is transferred to the screening programme database, hosted by the Regional Association of Statutory Health Insurance Physicians.

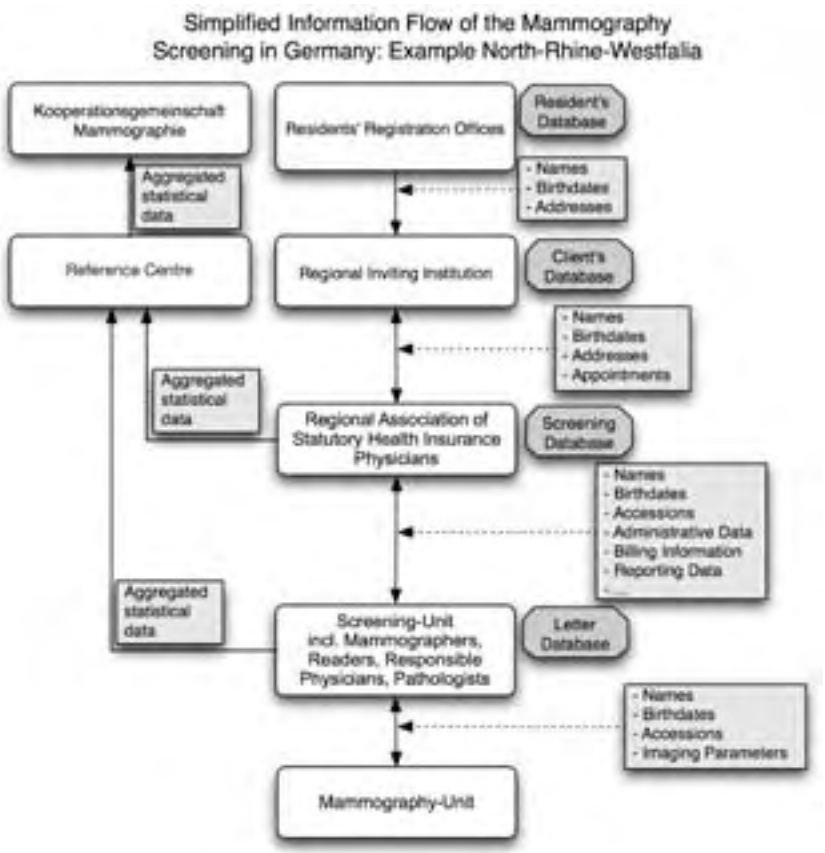
Resultant images are then double- or triple-read. In case of a suspicious finding, a conference is held, chaired by the responsible physician who has a high level of experience in mammography. Should the suspicion not be solved by prior exams or interpretation of the images, the client is invited for a second look at a related assessment unit.

During that visit a special mammography, ultrasound or even biopsy is performed and the result is discussed with the patient. If a specimen was taken, an interdisciplinary conference is held and the results discussed between experts in mammography, senology, pathology and oncology as well as radiation therapy. If cancer is detected and proven by the related pathologist, the woman is transferred to a breast centre for further examination and treatment. The costs is reimbursed for the client's visit on a quarterly basis about six months after contact with the client.

Challenges for the Screening Programme

I. Invitation System

As mentioned above, invitees are not obliged to respond to an invitation in either a positive or negative way. Therefore it will remain unpredictable how many people will attend the exam, wasting valuable time. Another organisational challenge is the administration of huge numbers of telephone calls from up to 10% of the invitees, who might ask for rescheduling or dropping the examination. No-shows are not prosecuted and instead sent a new invitation four weeks later.



After preliminary discussions with the clients in our institution, a higher response rate could be expected, if rescheduling would be possible for working women (50 to 65 years old). Therefore automated systems should accept calls and/or provide new appointments for those clients.

A second drawback will occur, if the notice of removal to the registration office is no longer obligatory. Another point is the vast variety of individual residents' registration offices with different technologies. Those have already given rise to confusion about personal information. Thus, the basis for the invitation is endangered. There is really no workaround available.

continued on p. 33

BREAST CENTRE MANAGEMENT

How to Provide Quality and Cost-Effective Care

In Germany, up to two out of every ten women will suffer from breast cancer during her lifetime. Around 17,000 out of 50,000 of these affected women will go on to die of the disease each year. In order to address this situation and to improve diagnosis and therapy procedures, breast cancer centres have been established throughout the country during recent years. This article explores the ways we structured these national breast centres in order to optimise patient treatment while maintaining cost-effectiveness.

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The certification of breast centres in Germany has gone through much development. Initially, hospitals had the power to designate themselves as centres, irrespective of any existing certificate. Particularly, in the state of Land Nordrhein-Westfalen (NRW), which has a high population density, breast centres that require special certification are nominated and supervised by the state government which is then overseen by the General Medical Council (Ärztekammer). In addition, several other forms of certification exist depending on the institution or society offering it (e. g. the German Society of Senology; the German Cancer Society, ISO 9001: 2000, OnkoZert, etc.).

European Society Provides Standards

Moreover, the European Society of Mastology (EUSOMA) offers accreditation (initially and fully) depending on facility equipment, patient numbers, levels of interdisciplinary collaboration, quality assurance, application of diagnostic and treatment protocols and follow-up. For initial accreditation, the centre is visited and audited by an international group. The requirements for a specialist breast unit were finally published in the year 2000 in the European Journal of Cancer, concretising the essential standards to which these units must work.

Several main health insurance companies have installed a Disease Management Programme (DMP) that also aims to optimise the diagnosis and treatment of women suffering from breast cancer. The programme's statutes were etablished in the year 2000. To enter this programme, patients can be enrolled either by participating hospitals or by the primary physician, which is usually the gynaecologist. A special form was developed for enrollment, which must be updated at least once every six months for five years.

Facing Budgets and Figures

Parallel to those efforts, breast cancer hospitals were then accorded the opportunity to process payments using the Diagnosis Related Groups (DRG) System. This led to a reduction in the time patients spent in the hospital, and consecutively to a condensation of work whose impact was mainly felt by the nursing personnel during the in-patient time.

EUSOMA recommends that breast centres should each cover from one-quarter up to one-third of a million of the total population. It also advocates that a breast unit's budget should be separate, rather than drawn from a number of more general budgets within the hospital. The recommendation was made to ensure a caseload sufficient to maintain expertise for each team member and to ensure cost-effective operations for the breast unit.

From that point of view, the national and regional aims in the NRW were comparable, but still ongoing. In the NRW region, which has the highest density of population, out of 250 hospitals, 50 centres should be designated. Meanwhile, 51 centres with approximately 128 operating locations have been nominated by the local government, which means a recruiting area of around 141,000 inhabitants per operating unit.

An Italian study (Pagano et al.) came to the conclusion that at least 200 primary cases of breast cancer have to be treated in a breast centre in order to reach a balanced budget. This is mainly due to the essential need for a high-quality service, which by necessity demands a highly specialised team working in an interdisciplinary setting. In other words, in statistical terms we have already come halfway towards achieving this benchmark.

Dealing with Rising Costs

Factors that will inevitably drive costs upwards include:

- New staff, e.g. breast-care nurses, psycho-oncologist, quality- and data-managers
- Doctors have to be specialists

- Additional conferences/clinics have to be organised and worked out
- Time pressure ("all in one visit") requires more specialist staff at all times

In order to address this, the following recommendations will ensure that a high-quality service can be provided, while remaining within budgetary targets:

- All facilities should be contained under one roof;
- An excellent IT department that can ensure information flow without talking or walking; help to compose medical reports quickly and easily and optimise the interface with the treating physician;
- Team spirit is of great importance, also in an interdisciplinary setting;
- Continuity of staff guarantees stability in human interactions;
- Responsibility of the treating team, with a dedicated contact person for that patient

The process for the patient is comparable to a chain with a number of links being in danger of breaking at the weakest point: this could lead to higher costs and damage trust. The above-mentioned factors will ensure a tightly organised path for the patients and by this save time and money.

Conclusions

In summary, breast cancer centres are confronted with parallel demands. Economic pressures require changing procedures in hospitals such as DRGs and quality management systems. Yet these centres have to operate within tight financial constraints to establish high-quality breast cancer centres according to national and European demands.

There is no other way, because optimising the treatment of breast cancer has been shown to lower both morbidity and mortality of the afflicted women. For example, a Scottish study (Gillis et al, 1996) demonstrated that there were 16% fewer deaths when patients were handed into the care of these types of specialist settings, a substantial risk reduction.

In terms of local, national and European standards and regulations, existing differences must be harmonised in order to avoid redundancies and to enable centres to enhance their optimising process. Thorough quality management protocol, data management systems and certification procedures will effectively lead to the kind of reliable benchmarking that will enhance sustainability. In areas with an unfavourable inhabitant-to-hospital ratio, the centralisation process should be accelerated in order to allow hospitals already offering high quality to operate at a cost-effective level. ❇

⏭ *continued from p. 31*

II. Reimbursement

The financial risk resides with the physicians leading the programme. All (up to five) mammography-units within one screening unit (see organigram) have to build-up, run (open at least three days a week for at least eight hours), and be maintained and surveyed by the physicians leading the programme. Reimbursement is based on each single case. According to the policies of the Regional Association of Statutory Health Insurance Physicians, reimbursement is available six months later at the earliest.

Since client participation is voluntary and the invitation system leaves no clear estimation of participation prediction, no one can estimate the real reimbursement for the project. Two actions have to be taken. Firstly, to promote the screening programme in the respective population and to find a way to get a high cooperation between gynaecologists, general practitioners and the programme to raise the participation rate and secondly, to find co-financing medical partners.

III. Timely information flow

According to the outlines of the contract between physicians and the health insurance companies, it is expected that the vast majority of the clients (600 to 800 per week in full scale running) have to be imaged, reported on, discussed (to about 8 - 10%) in the consensus conference and be informed within seven working days about the result of the exam. This is only possible by using precise and mainly automated information processing, which is not yet fully developed.

Self-developed programmes and server architectures are used in the Aachen screening unit to overcome these obstacles. Another point is the timely invitation of clients for the assessment examination – usually in the coming week on Tuesday or Wednesday, i.e. image retakes and additional exams. They have to be informed not before the weekend so as not to cause excess worry.

The most challenging issue is the obligation to have a second opinion reading for the bio-specimen, that has first to be reported on by the local pathologist and within about one and a half days by the reference pathologist for the first 1,000 exams. Digital means of transfer of huge amounts of data are now developed and installed, e.g. the Institute of Pathology of the University Clinical Center Aachen has a pathological specimen scanner that produces per case more than seven images each of more than 4 GB. New streaming technologies have been developed for sending those images online over the internet according to the required magnification and detail. ❇

Tungsten X-ray Tubes with Rhodium and Silver Filters Optimise Image Quality

Contributors
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Mammography is a technically demanding radiographic procedure. High resolution is needed and dose performance is an important concern. Clinical trials and scientific investigations using Hologic Selenia systems have found that a tungsten x-ray tube with a combination of rhodium and silver filters optimises image quality while minimising dose. This combination allows for important dose reductions (up to 30%), while maintaining the excellent image quality already achieved with the Selenia system. The use of a tungsten anode in the x-ray tube also offers superior performance for some of the advanced applications under development, such as digital breast tomosynthesis, iodinated contrast, and dual energy breast imaging.

DETECTIVE QUANTUM EFFICIENCY

The dose performance of a Hologic Selenia digital mammography system equipped with a tungsten x-ray tube was compared to a Selenia equipped with a molybdenum x-ray tube using the Detective Quantum Efficiency (DQE) at conditions simulating the same patient radiation dose of 1.0 mGy to the ACR phantom (standard breast). The DQE curves shown in Fig. 1 show that a Selenia system equipped with a tungsten x-ray tube Selenia system produced superior imaging to a system with a molybdenum tube.

RESOLUTION

Using the Modulation Transfer Function (MTF), the resolutions of a Selenia system equipped with a tungsten x-ray tube and a Selenia equipped with a molybdenum x-ray tube are compared in Fig. 2. The two MTF curves are identical and show that a Selenia system equipped with a tungsten x-ray tube offers the same high imaging resolution as a Selenia system equipped with a molybdenum x-ray tube. This conclusion is expected since both x-ray tubes have the same focal spot size, and both digital mammography systems use the same selenium image receptor with its high dose efficiency.

THE IMPACT OF X-RAY TUBE AND FILTER ON DOSE PERFORMANCE

The tube/filter combination used has a significant impact on dose performance. Our research has shown that a tungsten x-ray tube equipped Selenia system using both rhodium and silver filters has superior performance compared with traditional systems using molybdenum x-ray tubes and molybdenum filters. The silver filter is used for larger breasts and not only results in superior imaging performance at lower dose but also significantly reduces the x-ray exposure time to eliminate potential patient motion problems.

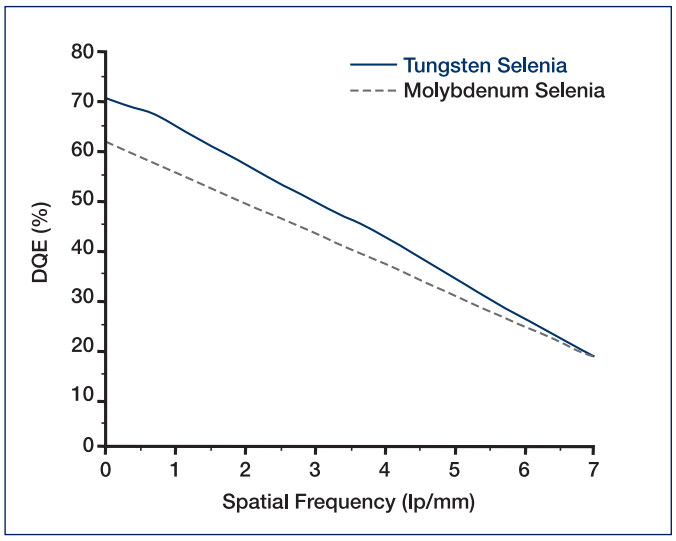

Fig. 1: DQE curves for systems using tungsten and molybdenum x-ray tubes at dose levels typical for a 4.5 cm breast show that tungsten is superior to molybdenum.

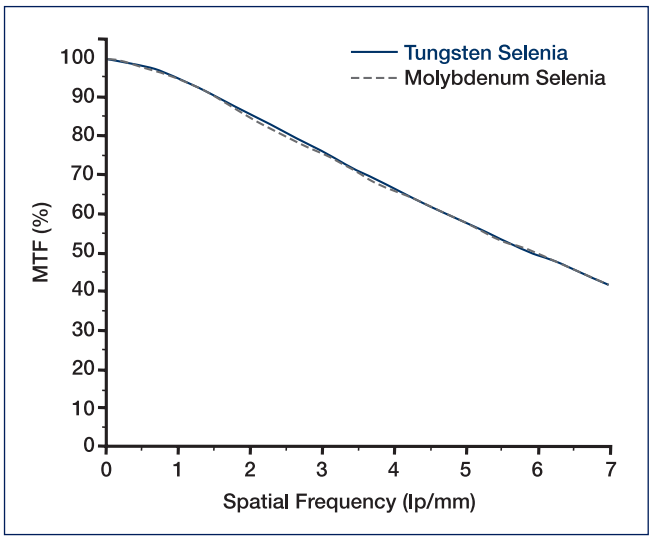

Fig. 2: The resolution performance for both tungsten and molybdenum equipped systems as measured by an MTF curve are equivalently high.

Clinical Benefits of Tungsten Digital Mammography

- Reduced patient dose
- Improved image quality
- Advanced applications such as tomosynthesis, dual energy, and contrast mammography

DUAL VERSUS SINGLE TRACK ANODE X-RAY TUBES

While it might appear that a dual track tube is advantageous for digital mammography because it offers more choices of anode material, there are significant technical downsides to the use of dual track tubes. Single track x-ray tubes are more reliable and less expensive. In addition, the maximum anode heat loading of dual track tubes are considerably inferior to the anode loads for single track tubes. A digital mammography system equipped with a single track tube can deliver the high current exposure needed for the largest breasts at an acceptable exposure time, reducing motion artifacts. Without this, images of large breasts are under-penetrated, suffer from long exposure motion blur, and have poor image quality.

The single track tungsten tube supports two to three times the maximum anode load compared to any dual track x-ray tube. More importantly, the use of a tungsten x-ray tube in combination with a rhodium filter provides equivalent or better imaging performance compared to a rhodium anode with a rhodium filter and indicates that the dual track x-ray tube is a poor choice for digital mammography systems.

CONCLUSIONS

The use of a Hologic Selenia digital mammography system with tungsten x-ray tubes offers superior imaging performance relative to x-ray tubes equipped with molybdenum or rhodium anodes.

The use of a tungsten x-ray tube with a rhodium filter offers superior performance to a molybdenum x-ray tube and a molybdenum filter. The use of a silver filter is superior to molybdenum or rhodium filters for the largest breasts. Single track x-ray tubes are superior to dual track x-ray tubes as their high anode heat loading allow for shorter exposure times.

In summary, the unique combination of a tungsten x-ray tube with rhodium and silver filters offers optimal dose and image quality performance for Selenia digital mammography over a wide range of breast thicknesses.

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Medical Doctors (respond below)

1. What is your occupation? (check only one)
   - ❑ Chief Cardiologist
   - ❑ Other Physician (please specify)

1a. What is your Cardiology sub-specialty? (check only one)
   - ❑ General Cardiology
   - ❑ Interventional Cardiology
   - ❑ Cardiac Radiology (Cardiac MRI, Echography, Cardiac CT)
   - ❑ Cardiac Surgery/ Cardiovascular Surgery
   - ❑ Paediatric Cardiology
   - ❑ Other (please specify)

1b. I am Chief of my Department
   - ❑ Yes
   - ❑ No

Non-physician professionals (respond below)

1c. What is your occupation? (check only one)
Administrator/Manager:
   - ❑ Cardiology Administrator
   - ❑ Cardiology Business Manager
   - ❑ Cardiology PACS Administrator

Executive
   - ❑ Chief Information Officer / IT Manager
   - ❑ Chairman / Managing Director
   - ❑ Director
   - ❑ Chief Financial Officer / other executive titles

Other
   - ❑ Medical Physicist
   - ❑ Academic
   - ❑ Chief Technologist
   - ❑ Manufacturer
   - ❑ Business Consultant
   - ❑ Distributor / Dealer

All respondents reply to the questions below

2. In what type of facility do you work? (check only one)
   - ❑ Private clinic
   - ❑ Hospital (check number of beds)
   - ❑ More than 500 beds
   - ❑ 400-499 beds
   - ❑ 300-399 beds

3. How many beds is your ward equipped with?
   - ❑ More than 30 beds
   - ❑ 15 - 30 beds
   - ❑ Less than 15 beds

4. With what technologies or disciplines do you work? (check all that apply)
   - ❑ Echography
   - ❑ Interventional Cardiology
   - ❑ Angiography
   - ❑ Cardiac CT
   - ❑ Cardiac MRI
   - ❑ Cardiology PACS

5. What is your role in purchasing
   - ❑ Final say
   - ❑ Influence
   - ❑ No role

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FINNISH RIS/PACS PROJECT

Second Stage Brings New Developments

In Spring 2006, the first phase of an innovative Finnish RATU project was launched, providing regional RIS/PACS and eConsultation service in Northern Finland. The area covered by the RATU project consists of five hospital districts and 69 healthcare centres with about 700,000 studies per year. Geographically, the RATU area represents roughly half of Finland with a diameter of approximately 600km. The project enables the production, processing and archiving of the northern region's entire image, biosignal and text data of patients, which are stored in a central archive. This article provides an update on the second stage of the project.

An intelligent and efficient radiology solution for such a dispersed community, phase one of the project saw all radiological exams and bookings transferred to the right place at the right time, improving healthcare information and speeding up treatment processes for patients. It allowed the inter-regional delivery and consultation of x-ray images over the internet, where participating hospitals can store, download and view patient information and images irrespective of geographical location.

Within the RATU area they emphasise both the sharing of patient information and creation of a network of experts from different organisations or countries. Changing the working environment so that patient information can be shared, as well as improving the usage of networked expertise delivers significant benefits: improving availability of professionals; making specialist capacity available to improve efficiencies in delivery as well as standardising working practices and enabling increased knowledge-sharing across organisational borders.

Second Stage of Implementation

Having completed the implementation of RIS and PACS, RATU is ready to move to the second stage: the construction of eServices to boost the implemented infrastructure. eServices fall into two categories: eServices for professionals including virtual consultations and second opinions and eServices for citizens.

At the same time the RATU archive will be an integral part of the coming national patient data repository of Finland. Through the national registry, RATU data will be viewable in the whole country. The keywords describing stage two in the RATU area are 'patient/citizen-centric, seamless, shared, secure and trusted, preventive, independent of time and place, networked, cross-organisational, cross-border and interoperable'. The RATU area aims to create a virtual and secure exchange for the provision and consumption of clinical eServices by developing a new working environment for professionals and teams, a shared workspace for virtual consultations and access to individual patient records.

eConsultation Portal Boosts Workflow

The networking of expertise has been realised in consultations and second opinions through an eConsultation portal in use in clinical practice today. Decision support by consulting colleagues and other experts for second opinions or by referring patients to other specialists are regular features of healthcare in the RATU area. In addition, networking for the purposes of acting both as ad-hoc and permanent teams of professionals in the management of complex illnesses and disorders is an established way of working. There are, for example, over 1,200 consultations per month performed by the Oulu University Central Hospital who have used the consultation portal for over six months now.

The eConsultation portal has allowed a market to develop where clients can browse through a virtual directory of providers and select the best match for their needs in terms of services offered, specialties covered, level of expertise, availability and price. The eConsultation portal has proven an important tool to increase productivity and improve reporting turnaround time. Reducing delays in diagnostic services makes it possible to reduce delays in treatment that could potentially have an adverse impact on quality of life and the health of the patient.

The RATU area is extending consultations across borders by participating in a European Commission-

funded project called R-bay where an eMarketplace is being built to buy and sell remote reporting and second opinion services across borders. The eMarketplace is a broker taking care of communications and data transfer in a secure and trusted way.

Towards a Citizen-Centred Community

eServices and special middleware are under development for patients/citizens. These include interactive booking/cancelling of appointments, viewing of individual patient data summaries, chronic disease management and self-care as well as personal health and well-being monitoring. It will also be possible to get information before and after hospital visits so that the patient is more informed and prepared. Interactive patient participation and a deeper understanding of the role of the patient and his immediate family plays a role in solving health problems.

Citizen empowerment and active participation in health and wellness management is being emphasised. This can be realised through a set of patient-centric eServices as well as coordinated resource-sharing and problem-solving in dynamic, multi-institutional virtual settings. The first citizen-centred eServices will be built in autumn 2007, partly financed by the Ministry of Social Affairs and Health.

Cross-Border Archiving in the Future?

Today, the RATU area is moving quickly to an enterprise archiving solution; Carestream's Versatile Intelligent Patient Archive (VIParchive) supports archiving of medical data, including electronic patient data and biosignals, etc. It also aims to store data in a patient-centric rather than data-centric way. Knowledge, information and data are central elements in diagnosing, treating and monitoring of patients.

The integrated RIS/VIParchive includes a patient's informed consent layer and provides the professional with permission to view exams and data beyond the current place of care.

Possible International Collaboration

There have been discussions on a possible model for cooperation between the Northern parts of Sweden and Norway and the RATU area, in order to use the RATU data centre as an off-site long-term archive for imaging exams produced in Sweden and Norway. In this model, on-line archives will still be located locally. Images will be logically separated, but remain physically in the same archive as the Finnish ones. The local sites have their own RIS and viewing capabilities, and only the archiving part of RATU will be utilised.

This model is useful because of the large amount of tourists travelling between the regions as well: with the patient's informed consent it will be possible to view tourist exams in Finland as well. Without consent it will be impossible for Finnish professionals to view any data from Swedish and Norwegian archiving segments.

The following legal questions need to be discussed when building a remote archiving service:

- Should we get the patient's informed consent in order to store images abroad?
- What legislation governs the storage, dissemination and destruction of information and how?
- What are the legal implications if the information management system/process fails in terms of confidentiality, integrity (completeness and correctness) and availability of information?
- Who owns the patient's images and imaging-related information such as requests or reports?
- What is the legally-determined storage time for medical images, requests and reports?

OVERVIEW OF THE HEALTHCARE SYSTEM IN TURKEY

Since the formation of the modern Republic of Turkey in 1923, successive governments have looked towards the West in the development of the country's economic models. This is reflected in Turkey's current candidature for EU membership. In the same period, Turkey has seen a relatively rapid population growth and a high rate of urbanisation. In spite of this, the Turkish community's central cultural value of collective social responsibility for health and welfare has remained strong.

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Driven by these influences, Turkey's health and social reform agendas have been ambitious in the past few decades. The growth in the healthcare sector has been substantial. Key recent gains have been built on a strong tertiary health sector, a gradual move towards corporate provider accountability and workforce development. These gains have been underpinned by relatively strong economic growth in the last few years.

According to the Annual Plan of the State Planning Organisation of Turkey, the country's population had grown to 72.9 million in 2006. This makes Turkey one of the twenty most populous countries in the world, between Germany and France. The same plan shows that the annual population growth rate is 1.24 %, or 1.41% in the year 2000. In 2006, 68 % of the population lived in urban areas.

The latest reports of the Ministry of Health show life expectancy in Turkey is increasing. In 2006 it was 74.0 years for women and 69.1 years for men: lower than the USA and higher than China. A current objective of the health service reforms is to increase life expectancy to international benchmarks. Turkey has a young population structure; 29 percent of the population is under age fifteen. The part of the population of age 65 and over accounts for seven percent of the total population in Turkey.

A Centralised yet Complex Structure

Turkey's health system has a centralised structure. However, in many aspects it suffers from fragmentation and complexity in the responsibilities and relationship of its component parts. Healthcare is provided by public, semi-public and private organisations, but there is limited coordination amongst them. Healthcare is financed by the government by tax and by premium and out-of-pocket payments. Last year, a new Social Security Institution was established by a law that combined four major different social insurance organisations and reassigned structural responsibilities for health and social insurance in Turkey.

The Ministry of Health (MoH) is the main government body responsible for health sector policy-making and implementation of national health strategies. This is progressed through a combination of funded programmes and direct provision of health services. The MoH is also the major provider of primary/secondary/tertiary healthcare, maternal health services, children's and family planning services. It is essentially the only provider of preventive health services through an extensive network of health facilities (health centres and health posts) providing primary, secondary, and specialised in-patient and out-patient services. According to MoH data, in 2006, the MoH had 795 public hospitals and 6,203 health centres. There were 56 university hospitals and a rapidly increasing count of 332 private hospitals.

Programme Establishes Independent Practices

In recent years a programme has been operating, which has established independent family medicine practices in a number of regions. A goal of this programme is to strengthen primary healthcare and the referral chain to improve access to and equity of distribution arrangements for diagnostic, specialist and secondary care services. ❊

Hospital Industry Privatisation Trends

According to the Ministry of Health statistics, Turkey had 332 private hospitals in 2006, a substantial increase from the count of 237 in 2002. A major factor associated with this increase has been governmental actions such as the social security institution's policy of purchasing increasing proportions of healthcare services from the private sector. These trends have been paralleled by a growth in private health insurance marketing and uptake. The Association of the Insurance and Reinsurance Companies of Turkey has reported that the premium income of private health insurance companies has increased from 12 million dollars in 1991 to 717 million dollars in 2006. According to the same data, almost 1.2 million people in Turkey have private health insurance and 36 private insurance companies were providing this cover in 2006.

The private hospital sector in Turkey has embarked on a vigorous export programme for elective surgery services as has been happening in other countries in the region with few regulatory constraints on the private hospital sector. This has further fuelled the growth of the private hospital sector relative to public hospitals.

Healthcare Expenditure Growth

The results of National Health Account Study in 2006 shows that Turkey's total health expenditure was 31.4 billion dollars (see table 1, below). It has four main sources of healthcare financing:

- Public expenditure - 22.8 billion dollars (72.4%)
- Private expenditure - 8.6 billion dollars (27.6%)
- Out of pocket expenditure - 6.1 billion dollars (19.3%)
- Other private expenditure - 2.7 billion dollars (8.3%)

Generally, out-of-pocket payments consist of direct payments to private doctors and institutions, premiums for voluntary health insurance and co-payments. In 1992, Turkey's total health expenditure was 6.02 billion dollars, public expenditure was 4.04 billion dollars (67.1%), and private expenditure was 1.98 billion dollars (32.9%). According to the National Health Account Study in 2006, healthcare expenditure has generally exceeded 7.7% of the gross domestic product (GDP). The proportion of GDP spent on healthcare increased from 1992 (3.7%) to 2000 (6.6%). Healthcare expenditure per person in Turkey in 2006 was calculated at 411 dollars, this compares with 103 dollars in 1992.

Radiology in Turkey

Radiological services in Turkey represent a substantial and growing proportion, approximately 6%, of the operating budget and approximately 20% of the capital assets of the health system. Diagnostic imaging services are distributed through hospitals, free-standing specialist diagnostic imaging centres and centres associated with other specialties. For years in order to overcome the waiting list problem, public institutions were allowed to refer the patient to private imaging centres. This resulted in a major growth over the past ten years in the utilisation of diagnostic imaging. However, this also resulted in the overuse of diagnostic imaging, creating a reflex on the payer side to lower the prices of diagnostic exams.

In common with other countries, some concern has been expressed in recent years about these arrangements. By next year, healthcare institutions will be prevented from referring their patients to imaging centres. However as an alternative, they will be able to cooperate with them as partners in service provision. Discussions are also underway on the need for a review of referral requirements and the process of accreditation of diagnostic imaging facilities. Major success factors in the growth of diagnostic imaging have included:

- Improved access to CT, MRI and PET facilities;
- Development of capacity in teleradiology and PACS facilities, and
- A commencement of reviews of funding and payment arrangements for diagnostic imaging services.

Conclusion

Turkey's healthcare system has been a major focus of its social and economic reforms over the past two decades. The pressure for reform has been escalated by Turkey's EU candidate processes. In addition to the gradual growth in Turkey's GDP there has been a substantial growth in the proportion of GDP allocated to healthcare. Structural reforms in the social security and health insurance arrangements are now providing potentially powerful tools for making Turkey's healthcare services more accountable and better equipped to lobby for the right resources in the right places. ❊

Health Expenditures, Turkey 1992 - 2006

	1992	1998	2000	2006
Public (billion dollars)	4.04	6.85	8.26	22.83
Private (billion dollars)	1.98	2.67	4.87	8.69
Total (billion dollars)	6.02	9.53	13.13	31.53
Health Exp. Per Capita (dollars)	103.00	150.00	194.00	411.00
Total Health Exp./GDP (%)	3.7	4.8	6.6	7.7

TURKISH SOCIETY OF RADIOLOGY

Presentation of History and Activities

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The Turkish Society of Radiology was founded in Istanbul in 1924. Its founding members included leading experts at the time, Dr. Sevki Bey, Dr. Suphi Neset Bey, Dr. Burhanettin Toker, Dr. Kilalditi, Dr. Zakar, Dr. Sukru Bey and Dr. Selahattin Mehmet Berk Bey. The goals of the society at the present moment are still in harmony with those originally set down in 1924.

The goals of the Turkish Society of Radiology (TSR) include supporting the progress of radiology as a science, preserving the rights and benefits of our members, and strengthening occupational, social and scientific relationships between its various members. We are also closely involved in the monitoring of domestic and international developments in radiology, particularly in x-ray, angiography, ultrasonography, computed tomography, magnetic resonance imaging, positron emission tomography, bone densitometry, interventional radiology and any new radiological advances.

We are also concerned with upgrading educational material for widespread use, and for this purpose, organising scientific congresses, seminars, symposiums, meetings and creating publications. Furthermore, we aim at increasing the level of radiologic education and its standardisation, organising courses and increasing the number of national health facilities in which radiology is practiced.

The society has three branches, based in Istanbul, Ankara and Izmir. Both radiologists and radiology residents have the right to join as members of the TSR. As of 28 February 2007, the society has 2,510 members, accounting for up to 85% of all practicing radiologists in the country. The TSR also works with subspecialty societies in a cooperative spirit.

Role of the TSR Journal

The TSR publishes a quarterly journal to disseminate new radiological information. Since 2005 this journal has been published in the English language as "Diagnostic and Interventional Radiology", as well as in Turkish, as "Turk Radyoloji Bulteni". Also, we published all of the scientific posters and oral presentations presented during the national radiology congresses, in a collective book.

The TSR has an actively functioning Board Commission. Board exams, which consist of two parts – one a theoretical exam and the other a practical exam - are held by the society to ensure the high quality of radiology services in the country. The first was held on 30 October, 2004. Only those participants who passed the first step were forwarded to the next step, which was the practical exam. In November 2007, the fourth nationally-instituted board exam will be held. This represents an increasing interest in ensuring the highest educational standards for radiology in Turkey.

National Congress Plays an Important Role

Between 1924 and 2007, the TSR has organised twenty-eight national congresses. The first national Turkish Radiology Congress was held between 15 - 17 September in 1966 in Istanbul. The 2007 congress was held between 27 - 31 October in Antalya. In parallel, all three branches of the TSR, based in Istanbul, Ankara and Izmir, arrange scientific meetings on a monthly basis except during the summer months. Besides these monthly meetings, symposiums are also held in various cities such as Malatya, Erzurum and Kocaeli. The TSR is a founding member of the European Society of Radiology (ESR), and it works proactively with its representatives within the commissions of the ESR.

Education a Priority for the TSR

The TSR also maintains an ongoing institutional cooperation with the Radiological Society of North America (RSNA) and takes part in its annual congresses. Additionally, in 2008 the Turkish/German Radiology Congress will take place due to a new partnership between the German Society of Radiology and the TSR. In the long term, the TSR envisions new projects regarding resident exchange with the purpose of improving radiology education.

The duration of the Turkish radiology residency programme is five years. This time period has been set out as sufficient for a comprehensive resident education according to the TSR. The society is of the opinion that new branch specialties like interventional radiology, neuroradiology and paediatric radiology will have to be instituted within the society in the near future, as they are growing at a rapid pace and the society wishes to ensure that Turkey keeps pace with the rest of the world in terms of radiological developments. ❊

EDUCATION AND TRAINING OF RADIOLOGISTS

The Turkish Perspective

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Medical doctors in Turkey graduate after following a six-year curriculum. According to set programmes, different concepts are used to teach radiological issues. Since 1996, most schools of medicine have been adapting their conventional curriculum to more modern programmes, such as problem-based learning where the students naturally learn radiology in the context of daily medical practice. Radiology has also been used to facilitate learning of human anatomy in these schools.

Since the topics of medical imaging are discussed related to problems and diseases, radiology permeates all aspects of medical programmes. In programmes where conventional strategies have been used, there are usually many lectures concentrated during the first years and usually there is a month-long clerkship course during the fifth year of medical school.

Residentship

To achieve residentship, physicians must enter a central exam. The preferences of candidates and their exam performances are the main criteria used to select residents for these programmes. A five-year radiology training period is mandatory all over the country and is administered by the Ministry of Health.

In total there are 67 institutes commissioned to run these programmes. 64 % of the institutes responsible for postgraduate education are represented by university departments. However, the number and distribution of academics are not in balance. Institutes had been applying their own curriculums before the Turkish Association of Radiology declared a core radiology curriculum in 2005. This core curriculum mainly follows the European Society of Radiology's curriculum.

Basic and advanced courses are encouraged and the minimum period of time for each modality and subspecialty is given with the curriculum. The association also recommends the use of a standardised assistant log book. In more than half of the departments these recommendations were accepted by the end of 2007.

The basic requirements in infrastructure and the qualitative standards for trainers were defined by the related committees of the Turkish Association of Radiology. However, not all the institutes have the optimum conditions and the accreditation processes are in early stages.

According to the state's directives, all residents have to be assessed in six-month intervals. The assessment methods may vary in every department but each resident has to complete a research work that is evaluated at the end of the training period. Final evaluation is made by an oral examination before graduation. The Turkish Ministry of Health gives these diplomas and no additional evaluated or quality confirmation is needed to commence professional practice.

The Turkish Radiology Association & Education

The Turkish Association of Radiology founded a Board of Radiology in 2002. At the beginning, more than a hundred academics and trainers were trained in measurement and assessment methods in written and oral exams. After a trial examination in each step with volunteers, exams were performed once every year. The second step examination is dedicated to the assessment of professional skills and cognitive skills like interpretation, differential diagnosis and clinical reasoning as well as the motor skills of the radiologists in areas such as performing ultrasonography. Certification is valid for five years and radiologists are recertificated if a certain amount of CME credit is collected in the end of this period.

Residents in most of the institutions are responsible for on-call operations, and emergency unit rotations are included in the training programmes. Nuclear medicine, internal medicine and radiation oncology rotates for three months and each is mandatory according to the official rules. Subspecialty training is not officially accepted but in many institutions training is organised according to an organ-system basis and residents are equipped with the basics of these subspecialties. ❊

INTERVIEW WITH DR. SILVIA ONDATEGUI-PARRA

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How did you come to be involved in healthcare economics and medical management?

My interest in management started during medical school. This is the reason I went through a pioneering four-year residency programme in hospital administration. I also achieved other advanced degrees in the field. I spent the last six months of my residency as a Fulbright Scholar in the US and felt attracted by the American style of healthcare management. So, I stayed working as a member of the executive team of the Brigham and Women's Hospital and Dana Farber Cancer Centre (both affiliated to Harvard Medical School) for several years. Currently, I get to practice as healthcare manager in Europe and as faculty at Boston University Medical School, combining my passion for the European lifestyle and American academics.

Why is healthcare management a growing topic for radiologists?

In the words of Dr Margaret Chan, Director-General of the World Health Organisation (WHO) in an address to the Directorate for Health and Social Affairs, Norway, "We face three main problems. For some diseases, we have no tools or only imperfect ones. In other cases, we have excellent tools, but high cost puts them beyond the reach of the poor who need them most. Third, we often have powerful interventions that are cheap or even free, but fail because we lack the systems and personnel for their delivery."

Healthcare management matters are hot topics nowadays, not only because of a growing focus on cost-led medical departments and payment-by-results schemes, but also because of the growing globalisation of the world's healthcare industry with the advent of telemedicine and the growth in outsourcing. Technology has truly transformed how doctors, consumers and insurance companies are interacting. New systems aim to reward efficiency, support patient safety and encourage waiting list reductions. Importantly, this changing healthcare model will ensure a more consistent basis for medical funding rather than being reliant on inherited and often antiquated budgets or the bartering skills of personnel in the management chain.

How have growing financial pressures added to this growth?

Increasingly, money is linked to the amount of output achieved. Therefore efficiency is the key priority of every healthcare manager today. Strides in medical healthcare technology will inevitably never offset the growing burdens being met by struggling national healthcare systems across the world. However, by increasing the information available to hospital and department administrators we are ensuring that what resources are available, are being maximised in an informed and responsible manner that leads to the best outcome for patients and the continued growth of the individual healthcare unit.

Understanding the economics of healthcare for the individual stakeholder is the only way to make the system stable and self-sustaining. Since "money doesn't grow on trees", to be familiar with the revenue and cost cycles is the only possible way to achieve success in healthcare as in any other system.

Why is healthcare management knowledge so under-disseminated in the field of medicine?

The main reason for this lack of dissemination is the traditional focus on the scientific and clinical aspects of healthcare fostered by medical education,

rather than the cost and the affordability of healthcare, particularly for populations. I believe the increase in the number and quality of education programmes related to health management, such as MD & MBA programmes, is changing the traditional model.

What are the three most important management challenges that will face medical managers in the coming years?

The three most important challenges are resources, resources and resources! The aging population, advances in technology and the current economic environment force the health systems and organisations to work efficiently. Once all the stakeholders, including governments, insurance companies, providers and the industry, accept it, then it may be possible to roll out a more stable system.

How is the US different to Europe in its approach to medical management education?

More than compulsory education, it is the system itself that fosters interest in medical management education. The US system's competitiveness makes a savvy medical management a key element. In addition, the undergraduate degree programmes are more prevalent and better established in the US.

What main healthcare economics/management courses exist in Europe and the US that might be interesting for department leaders?

With respect to radiology management courses in the US, I'd recommend the Association of University Radiologists (AUR) course as well as the Radiological Society of North America (RSNA) programme. In Europe, the International Diagnostic Course in Davos organises every year an appealing "mini MBA" type of programme. The Management in Radiology (MIR) society also has a yearly meeting and course. Since the management of diagnostic imaging is a hot topic the demand for these programmes is increasing. ❊

ECR 2008: Acting on reliable information

Visitors at the European Congress of Radiology (Vienna, Austria 7-11 March, 2008) will have a chance to experience first-hand radiology information systems and reporting solutions that are powered by SpeechMagic™ – the award-winning speech recognition platform from Philips.

"In radiology reporting 'powered by SpeechMagic™' has established itself as a seal of efficiency and accuracy. Third-party solutions that integrate SpeechMagic can therefore be seen throughout the congress – at more than 40 workstations", said Anne Durand-Badel, regional marketing manager for Philips Speech Recognition Systems.

Durand-Badel said that together with its partners, Philips is advancing speech recognition to support patient safety by helping radiologists capture vital information in the RIS or EHR. This will help to provide clinicians with accurate and reliable information which they can then quickly act upon.

The lack of adequate information at the point of care is a common cause of medical errors. In Italy medical errors result in up to 90 deaths a day (*Special Eurobarometer "Medical Errors", January 2006, European Commission, DG Health and Consumer Protection*). In Germany, 38,000 patients per year are believed to die because of bad teamwork and communications or poor IT support (*www.klinik-heute.de*), and 850,000 medical errors are reported from the UK each year (*National Patient Safety Agency*).

"Fast and accurate information capturing in RIS and EHR systems with the help of speech recognition contribute to avoid those errors," underlined Anne Durand-Badel.

Philips has recently been honored by Frost & Sullivan with the 2007 Global Excellence Award for its demonstrated leadership in the field of speech recognition technologies for the healthcare market. According to Frost & Sullivan, Philips "has excelled in anticipating market demand for speech recognition solutions, leveraging both global and regional integration partnerships, improving its customer service offering and introducing innovative, industry-leading technologies."

A list of Philips Speech Recognition Systems integration partners at ECR 2008 is available at *www.philips.com/speechrecognition*.

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HOW TO...

ELIMINATE WAITING LISTS IN MEDICAL IMAGING

Experiences of the Scottish Diagnostic Collaborative

There is no doubt that the premise of this article may attract those who wish to see an easy answer to the ongoing and international issue of diagnostic waiting times. Let me tell you right away that there is no quick fix or magic solution. There is, however, a definite upward trend for systematic improvement, which has worked for us and continues to do so as we reduce waiting times incrementally and improve patient access to our services and therefore patient safety.

Long waiting times for diagnostics have historically been a matter not just of concern to the health service but of patient, public and government concern. The Minister for Health for Scotland announced waiting times targets in 2005, that increased pressure on an already strained service.

At that time, the perception of staff and equipment shortage was widespread. In conjunction with the targets, a Scottish Diagnostic Collaborative was announced under the auspices of the Scottish Government to support service delivery on waiting times.

This involved definition of an information set to 'performance-manage' improvement, process mapping, rigorous gathering of demand, capacity and queue information with identification of key constraints through an integrated delivery approach.

High Impact Changes that were previously identified by the English Department of Health Radiology Service Improvement Programme, were applied here too. Good practice was shared via national learning events, websites, knowledge exchange and a support network with clinical leadership, management and executive support. With all this input, targets were achieved five months ahead of the set deadline.

Results of the Programme

Prior to the initiative, there were in excess of 6,000 patients waiting over nine weeks for the four key diagnostic tests under scrutiny. From a radiology point of view these were MRI, CT, ultrasound and barium enemas. In addition, there were endoscopy and cystoscopy investigations in the same collaborative programme. Eighteen months into the two year programme, these patients achieved full compliance with waiting list guidelines.

This large project received dedicated national and local resources in terms of clinical leadership and management support. Fundamental to success was an understanding of the service room-by-room, department-by-department and hospital-by-hospital. There was no attempt to impose single national solutions or templates but rather the ethos was that of an in-depth comprehensive understanding of local services by local teams.

Essential to this was gathering of information on local demand, activity and queues, and focusing on improving the patient journey and therefore their care experience.

Local Process-Mapping the Key to Success

National definitions were agreed through a clinically-led multidisciplinary team, in-

volving the national Information Statistics Division of the Scottish Government. Then a Diagnostic Monthly Management Information dataset was defined. This was to allow local teams to locally performance-manage changes in the service and to give a national overview by aggregation of information.

Baseline information was gathered by local services and, in the first instance, not all RIS were specified to gather all the required information. Manual collection was initially financially supported.

Local process-mapping of the patient journey through services was undertaken. This exercise involved patients and all those involved with delivering the service including medical staff, radiographers, receptionists and porters defining the steps from primary care request for imaging, receipt of the request in imaging departments, though the various steps.

These included the request form being made, e.g., queuing to be vetted in a bundle and then appointing, followed by the patient then receiving and agreeing the appointment, followed by attendance and the steps in the department before, during and after the investigation and finally the reporting of it together with dispatch of the report to the referring clinician.

Take Account of Missing 'Steps'!

Historically, information gathering is based around activity. With the DCAQ model (Demand, Capacity, Activity and Queue), a new approach was undertaken where true demand on the service was recorded. This involved all requests being noted. Those which, following vetting for appropriateness, did not proceed to investigation still involved 'work' for the imaging department and acknowledgement of this is a step in identification of true demand.

Capacity is often thought of as room availability for an investigation. In fact the definition of true capacity is when the room is available and there are the appropriate staff available to perform the investigation.

Defining Real Demand

This taking account of staff unavailability through planned holiday, study leave, etc., but also room availability due to planned maintenance etc. was another overlooked step. The queue was defined as agreed work which had yet to be done. All was measured in the common currency of time. This gave a real feel for demand (what needed to be done), activity (what was done), capacity (what could be done) and queuing levels (backlog) and therefore a realistic profile of local service provision.

Apply High Impact Changes

Having identified this, the aforementioned High Impact Changes were applied though with a nod to the dictates of local key constraints dictated, which were different in each locality. These were:

- Patient-focused booking to reduce non-attendance.
- Pooling of referrals between consultants to shorten access times and improve equity of access.
- Moving from multiple points of referral to a single point to shorten access times.
- Introduction of straight-to-test protocols to reduce unnecessary delays in the process.
- Effective management of medical annual leave policies to reduce lost capacity.
- Use of scheduling templates to increase capacity.
- Use of referral protocols to ensure appropriate referrals for each diagnostic test.
- Administrative and clinical vetting of referrals to reduce unnecessary referrals.
- Regular validation of existing waiting lists to ensure the identified test is still the most appropriate one for the patient.
- Extended working hours to increase capacity and flexibility for patients.
- Introduction of new and extended roles for staff to increase capacity.

Waiting times were reduced, but there were additional benefits. These were improved choice for the patient, reduced non-attendance and improved governance and patient safety as a result of rigorous attention to process maps and referral criteria.

> **"Targets were achieved five months ahead of the set deadline"**

Conclusion

Fundamental lessons have been the essential of robust locally-gathered and respected information to understand the service and inform the impact of improvements. Sharing of good practices through a blend of mechanisms supported by clinical leadership and executive sponsorship has been powerful.

The importance of the patient and all staff perspectives in process mapping for a 'reality check' has been invaluable. Recognition of human factors and a spectrum of approaches to engage and embed change with sharing resulted in adoption and influence. Sustainability is the next challenge! ❇

AGENDA

Key Seminars & Conferences

March 2008

6 **Annual Scientific Meeting of the European Society of Breast Imaging**
Vienna, Austria
www.eusobi.org

7 – 11 **European Society of Radiology (ESR) Annual Congress**
Vienna, Austria
www.myesr.org

12 – 15 **52nd Annual Convention of the American Institute of Ultrasound in Medicine**
San Diego, US
www.aium.org

13 – 16 **16th Annual Meeting of the Asian Society for Cardiovascular Surgery**
Singapore
www.acsvs2008.org

15 – 20 **2008 Society of Interventional Radiology (SIR) Annual Scientific Meeting**
Washington, DC, USA
www.sirmeeting.org

16 – 21 **28th Annual Resident's Review Course**
Coronado, US
www.ryalsmeet.com

24 – 28 **Erasmus Course Basic MRI Physics**
Dundee, UK
www.emricourse.org

28 – 29 **ESIR – Ablation Tumorale Par l'Image**
Strasbourg, France
www.cirse.org

28 – 29 **ESIR – Peripheral Arterial Disease**
Amsterdam, The Netherlands
www.cirse.org

28 – 30 **South Asian Conference on Radiology**
Kathmandu, Nepal
http://sacor.org.np/

30 – 04 **IDKD 40th International Diagnostic Course**
Davos, Switzerland
www.idkd.org

April 2008

4 – 6 **67th International Meeting of the Japan Radiological Society**
Yokohama, Japan
www.secretariat.ne.jp/jrs67/english/invitation_eng.html

7 – 11 **IHE Connectathon**
Oxford, UK
www.ihe-europe.org

7 – 8 **Annual Meeting of the National Council on Radiation Protection & Measurements**
Arlington, US
www.ncrp.com

9 – 10 **European Conference on Embolotherapy**
Florence, Italy
www.et2008.org

10 – 12 **ESGAR Hands-on Workshop on CT-Colonography**
Vigo, Spain
www.esgar.org

11 – 13 **Internationaler Fortbildungskurs Moderne Mammodiagnostik und Therapie**
Erlangen, Germany
www.comed-kongresse.de

12 – 15 **30th Charing Cross International Symposium**
London, UK
www.cxsymposium.com

13 – 18 **108th Annual Meeting of the American Roentgen Ray Society**
Washington, DC, US
www.arrs.org

23 – 26 **International Society for Radiographers and Radiological Technologists (ISRRT) 15th World Congress**
Durban, South Africa
www.isrrt.org

30 – 03 **89th German Radiology Congress**
Berlin, Germany
www.roentgenkongress.de

June 2008

4 – 7 **31st Postgraduate Course & 45th Meeting of the ESPR**
Edinburgh, UK
www.espr.org

5 – 8 **25th International Congress of Radiology (ICR)**
Marrakesh, Morocco
www.icr2008.org

5 – 9 **8th Asia Pacific Congress of Cardiovascular & Interventional Radiology**
Kuala Lumpur, Malaysia
www.apccvir.org

10 – 13 **European Society of Gastrointestinal and Abdominal Radiology (ESGAR) 2008 Annual Meeting and Postgraduate Course**
Istanbul, Turkey
www.esgar.org

14 – 18 **Society of Nuclear Medicine, 25th Annual Meeting**
Honolulu, US
www.snm.org

25 – 28 **CAD – 10th International Workshop on CAD**
Barcelona, Spain
www.cars-international.org

25 – 28 **EuroPACS Annual Congress**
Barcelona, Spain
www.europacs.org

25 – 28 **CARS Annual Congress**
Barcelona, Spain
www.cars-international.org

July 2008

20 – 23 **9th International Workshop on Digital Mammography**
Tucson, Arizona
http://iwdm2008.org/

Issue II: Hot Topics

- *Emergency Radiology: Managing Change*
- *Product Comparison Chart: MRI*
- *How To Understand a Workstation*
- *Conducting and Reporting a Cost-Effectiveness Analysis*
- *Medical Imaging in Austria*

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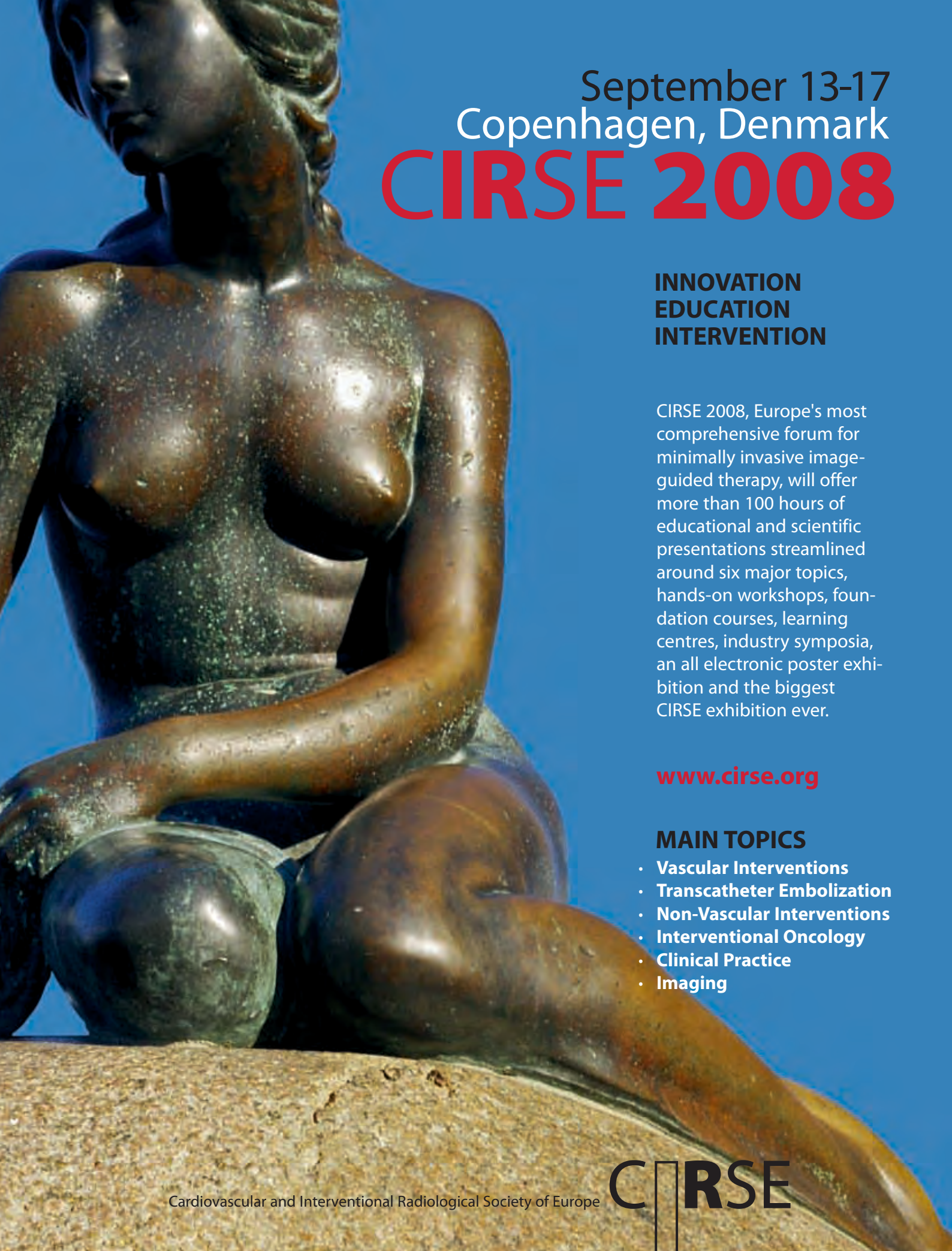

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