

# I M A G I N G

## M a n a g e m e n t

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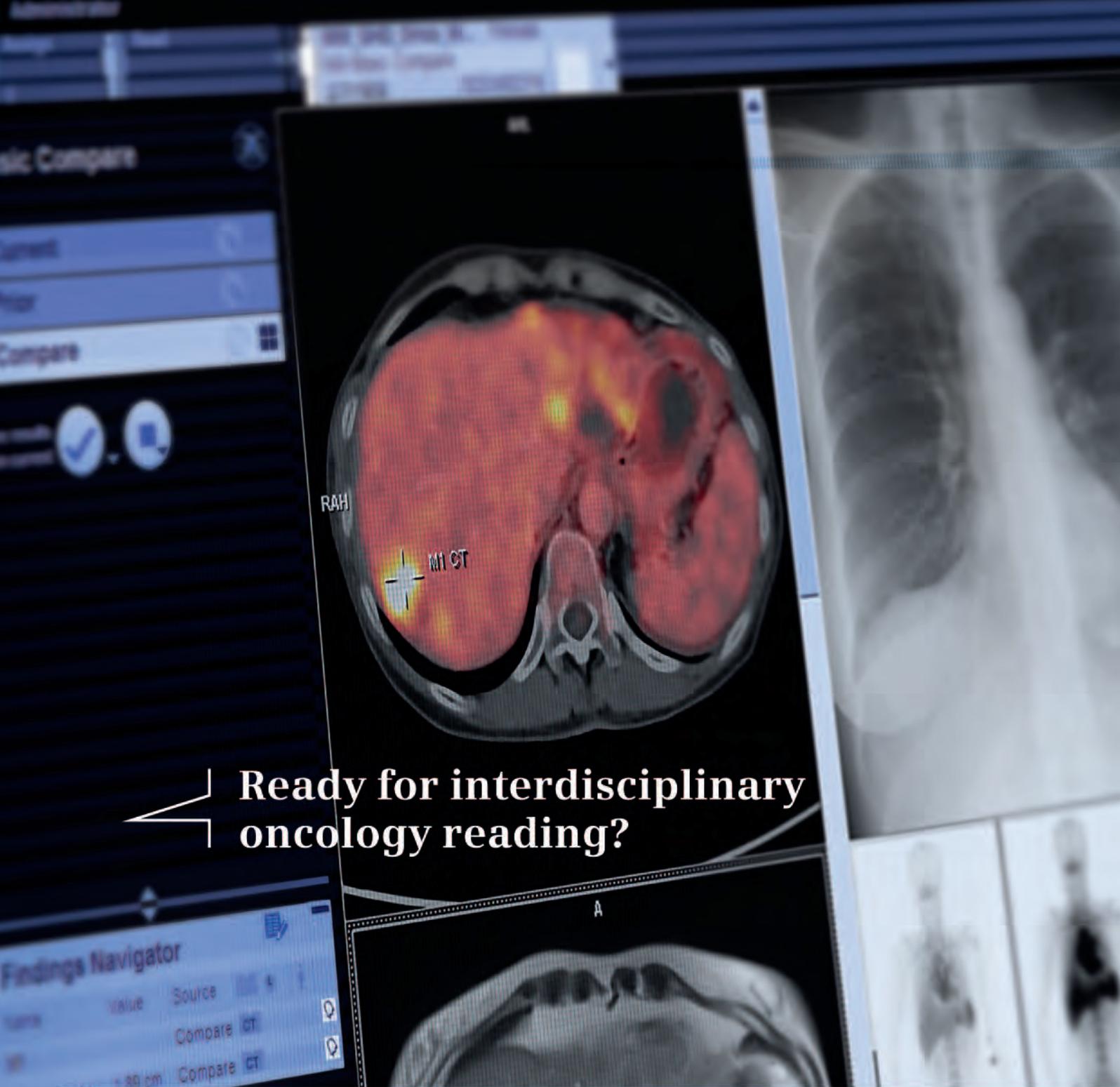
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# Managing Patient Communication

Dear Readers,

The focus of this edition is on patient management topics in medical imaging; we cover the ins and outs of informed consent in interventional radiology, the decreasing visibility of radiologists to their patients and referring clinicians and the issues surrounding this, as well as ways to reduce patient anxiety and the role of nurses in improving and facilitating communication.

Patient questionnaires can reasonably easily assess their satisfaction with a service that has been provided. However, these will only address the narrow issues of the ease and timeliness of arranging appointments, the efficiency of the examination, the quality of the changing facilities and the care and consideration of the radiographic and support staff in the department. The actual quality of the examination will not be appreciated by the patient and although they will be informed of the result of the study by the referring doctor, in most cases they will not know the pivotal role of the radiologist in the interpretation of the examination, the relevance of the findings to their clinical condition and the overall management of the whole patient pathway.

Obviously those examinations with considerable direct radiologist contact with the patient such as ultrasound studies or interventional procedures will be exceptions but even in these areas, in some countries the ultrasound studies are performed by others and in interventional cases the contact may be limited to the procedure itself or the consent process.

This lack of awareness of the role of radiologists and often radiographers by patients has increased significantly due to digital imaging systems such as CT and MR and is compounded by the growth of teleradiology, which may even excise the contact between clinicians and radiologists and in mobile units with radiographers. In many cases where patients are undergoing computerised exams the radiologists may not be in the same building. The vast increase in workload

and throughput required by modern high capital cost imaging systems has reduced further the contact with patients in the imaging departments and often presents an impersonal environment for the patient. The importance of recognising patient concern and stress of an unknown diagnosis must be recognised and addressed.

Radiologists have often spent time in direct clinical patient care prior to specialising in radiology. They should be confident to deal directly with patients and ensure they are available to discuss patients' symptoms and concerns prior to the exam and to make it clear that they will be reporting the exam. Where appropriate they should be willing to communicate the results of examinations directly to the patient while bearing in mind that breaking bad news must be undertaken only in the right circumstances.

Radiologists should also ensure that they involve themselves in multidisciplinary discussions and clinical meetings and be available to discuss findings and manage individual patients' imaging pathway. Radiologists undertaking interventional procedures must take a full part in the clinical care of their patients and should be prepared to be responsible for cases in hospital and outpatient departments where appropriate. Managers must ensure they have access to the necessary hospital resources on equal terms with other clinicians.

In essence, despite the pressure of reporting examinations and the analysis of multiple images and computer based reconstructions they must get out and communicate with the patient and maintain a close dialogue with all clinicians.

*\*European Society of Radiology. The future role of radiology in Healthcare. Insights Imaging 1:2-11*




Prof. Iain McCall

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## 12 MANAGING PATIENT COMMUNICATION

Despite the misconception that medical imaging professionals are more comfortable with technology than with patients, the focus on communication is a growing topic amongst managers. A focus on delivering value for money from high cost capital investments in technology in the medical imaging department has created an undesirable distance between the radiologist and their patient. However, increasingly radiologists are addressing this need to maintain a stronger and more direct connection, not just with patients but also with referring clinicians and across collaborating departments. In this edition's cover story, you will find a discussion of the hot topics in managing communication; from techniques for delivering bad news and dealing with anxious patients, to the cost of neglecting to stay in touch with patients, and a look at issues surrounding the area of successful communication for informed consent, coordinated by our partner association, CIRSE.

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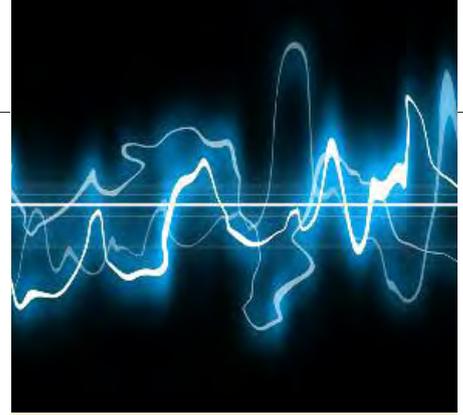
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## 12 NUCLEAR MEDICINE

This article aims to assist those concerned with best practice in managing oncologic patients, from the point of view of imaging's ability to monitor tumour response. As is widely known, 18F-FDG PET/CT has an established role in the diagnosis and staging of a wide variety of solid cancers. As anticancer therapy becomes more individualised, it is increasingly important to identify response to treatment as early as possible. Early identification of responders and non-responders may allow physicians to optimise treatment and to spare costs and morbidity in these patients. This article sheds light on this and other related issues.

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# 13<sup>TH</sup> ANNUAL MANAGEMENT IN MEDICAL IMAGING (MIR) SCIENTIFIC MEETING

## Highlights from Key Sessions

The 13th Annual Scientific Meeting of Management in Radiology (MIR), a professional meeting bringing together chairmen, managers and business administrators of medical imaging departments worldwide, took place in Palma, Mallorca from 14 – 15 October, 2010.

The official business and management assembly for leaders in diagnostic imaging, the MIR meeting once again drew an impressive line-up of top speakers to present and debate their common professional challenges as well as their solutions particular to the medical imaging department.

### Workflow and Image Management

This year's meeting kicked off with a discussion of the optimal processing and management of images and related data, centering on the explosion of volumes of data since the transition to digital imaging. The cost-effectiveness and

utility of current data management methods was heavily discussed during a pre-congress Wednesday workshop on image compression, which drew some of the leading experts in the field to come together. Thus, the opening session highlighted some of the main challenges discussed during this hot topic meeting.

David Koff (Canada) began with a look at image compression issues, summarising and reviewing the Canadian medical imaging community's stance on image compression as a means of managing data. As a large country, Canada is reliant on large volumes of bandwidth for fast image and data transfer – one way they found to manage this better is to use lossy compression, where non-relevant data are discarded. Importantly, Prof. Koff shared the results of a legal analysis that was made on the use of compression, which set some ground rules for its appropriate use. For example, it was decided that radiologists ought

to use lossy compression in primary reading to avoid recalls after reporting. Discussions following this session revealed vendors need to do more to provide tailored and integrated PACS systems for the use of lossy compression. Lawrence Sutton (UK) continued with a discussion of how long images need to be kept asking the audience: "What do we want our images for, and what would we like to do with them? How can we share our data?"

### Regrettable Management Decision Forum

A recurring theme in the MIR congress during previous editions is an interactive discussion involving a key group of speakers that explores best practice guidelines for managers ("The 10 Commandments of Medical Imaging Management", Oxford/2008 and "The Best Management Decision I Made in my Department", Riga/2010). This year proved no different, with



a look at “The Management Decision I Most Regret and Why”.

This session explored lessons learned from making missteps and from missed opportunities and provided the opportunity for intense solution-focused debate following the session between audience members and speakers. Addressing gripes was a key focus for speaker Prof. Stephen Baker (U.S.) who followed an earlier entertaining talk on “How to Win Every Argument” with a discussion about how hiring dysfunctional employees can have a welter of negative consequences for the department – disrupting morale and even resulting in litigation. The moral of the story was that the need to investigate a potential employee fully before hiring is paramount, with the additional lessons to build the department from within, and to “hire a workhorse, not a show horse”. This session provoked much response from the audience, many of whom stated that for example, in the UK, one can’t ask about a candidate’s background. Also, in the UK another issue is that the chairman of the medical imaging department does not have the luxury of terminating the contracts of uncooperative or unproductive employees. In general, attendees found the subsequent discussion on dealing with resistant and

subversive employees and alternative strategies for their management, to be highly useful.

Prof. Michel Claudon (France) then discussed the necessity of proper evaluation prior to starting a new project: Checking out not only the local consequences for a large-scale regional project, but ensuring that the enthusiasm of other project leaders is not due to the kind of advantage that would influence their motivation for getting involved. The lesson learned was that as the responsibility for initiating new projects stops with the project leader, it’s important to be as informed as possible. Prof. Luis Donoso (Spain) then spoke about the usefulness of regret – stating that if we can anticipate the regret we can improve our decision-making process. A few of the areas of regret he touched on included delays in action, trying to work an organisational structure that is not consistent with the current organisation, not showing enough commitment to strengthening the role of radiographers, and not involving others in management decisions enough.

#### Friday’s Sessions

Friday’s sessions began by addressing management issues in radiation protection, with a

line-up of three speakers discussing issues such as management of radiation protection in fluoroscopy imaging, the impact of responsible authorities on the medical imaging department, and imaging guidelines in pregnancy – defining the department’s policy. It followed up with a session on teleradiology, a recurrent theme for the congress as it strives to keep attendees updated on the latest facets of this ongoing debate, particularly in the field of legal issues and new trends. Finally, the meeting concluded with a look at the management issues faced by medical imaging managers and chairmen in the host country, this year Spain. A presentation by the Spanish Society of Management and Quality in Medical Imaging summarised the achievements made by this association, and followed with a focus on the IT management issues particular to Spain. All in all, the congress was received very positively by attendees, who state that its practical usefulness is invaluable. Interviews with attendees and speakers, photos and session highlights will be made available on the [www.imagingmanagement.org](http://www.imagingmanagement.org) website. ■

More information is available at [www.mir-online.org](http://www.mir-online.org).



## CIRSE Unveils Global Interventional Radiology Statement



42 national and international societies from around the world united to support the "Interventional Radiology (IR) Global Statement", which highlights the importance of IR in modern medical care and outlines the identity and scope of IR practice worldwide. The Society of Interventional Radiology (SIR), the Cardiovascular and Interventional Radiological Society of Europe (CIRSE) and 40 other national and international scientific societies have joined in supporting the first global statement defining interventional radiology as a unique specialty providing key treatment options for a wide range of medical conditions. The statement addresses the evolution, global impact and future direction of this image-guided minimally invasive specialty. The statement, the result of more than two years of collaborative work, was co-published in August in the Journal of Vascular and Interventional Radiology (JVIR) and Cardiovascular and Interventional Radiology (CVIR). The Global IR Statement stresses that interventional radiologists are responsible for providing clinical care relevant to image-guided interventions, either in collaboration with other physicians or independently.

Further information is available on [www.cirse.org](http://www.cirse.org)

## ECRI Institute 17th Annual Web Conference



ECRI Institute® has named Kaiser Permanente, a healthcare provider and not-for-

profit health plan, as the winner of the 5th annual health devices achievement award for excellence in health technology management. The award recognises an outstanding initiative undertaken by an ECRI Institute member healthcare institution that improves patient safety, reduces costs, or otherwise facilitates better strategic management of health technology.

Kaiser Permanente's winning submission describes its groundbreaking initiatives, the National Total Joint Replacement Registry (TJRR) and the Cardiac Device Registry (CDR). These are comprehensive databases covering almost 150,000 joint replacement and cardiac implants from regions across the United States. The registries allow the analysis of implant statistics, including complications, failures, replacements, usage, and costs. Mining these data identifies the most effective devices and surgical techniques, as well as patients who are at risk for re-operations and surgical complications.

Further information is available on [www.ecri.org](http://www.ecri.org)

## CARS Congress 2011: Abstract Deadline Approaching



The joint Annual Scientific Meetings of the ISCAS, EuroPACS, CAR, CAD and CMI societies are scheduled to take place during 2011 in Berlin from June 22 – 25. Please note for all those interested, that the deadline for paper and abstract submissions for the congress is January 10, 2011.

The CARS Congress Organising Committee invites you to join them in Berlin in June 2011, if you work in the fields of radiology, surgery, engineering, informatics and/or healthcare management and have an interest in topics, such as

- » Image- and model-guided interventions;
- » Medical imaging;
- » Image processing and visualisation;
- » Computer aided diagnosis;
- » Medical simulation and education;
- » Surgical navigation and robotics;
- » Model-guided medicine, and
- » Personalised medicine.

Further details can be found on [www.cars-int.org](http://www.cars-int.org)

## IHE Participates in EU-Level Programmes



The European Commission has made substantial progress driving greater consistency between countries through a number of European-level initiatives and has won support for programmes covering multiple areas of interoperability. A policy recommendation on interoperability for electronic health records combined with a proposed Directive on patients' rights in cross-border healthcare has advanced to the European Parliament and may be adopted next year.

Meanwhile five European-level programmes are currently underway that are pioneering policies and processes crucial for increasing consistent interoperability within the countries and the eventual implementation of pan-European data exchanges. IHE-Europe is an active participant in four of these programmes: European Patient Smart Open Services (epSOS), Health Interoperability Testing and Conformance Harmonisation (HITCH), Smart Personal Health Systems (SPHS), and European e-health Governance. A fifth programme, e-health Interop also called Mandate 403, is scheduled to be launched soon.

Further information at [www.ihe-europe.net](http://www.ihe-europe.net)



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Royal Philips Electronics and Electron, a Russian medical equipment manufacturer, announced that they have completed Russia's first installation and clinical validation of a domestically made Computed Tomography (CT) scanner at the Hospital of War Veterans in St. Petersburg. The two companies have received clearance by the appropriate authorities to market the scanner, which has been designed specifically for the Russian healthcare market, throughout Russia.

The 16-slice CT scanner and its peripherals have all been produced at the production facilities of Electron in St. Petersburg. Its hardware and software for medical data storage and processing are tailored to the specific demands of Russian hospitals. It is the first scanner with a Russian-language interface, key to increasing the efficiency of diagnostic procedures and efficient training of medical personnel.

**HOLOGIC**

This year at RSNA, Hologic invite attendees to take a closer look at their latest digital mammography including Selenia® Dimen-

sions®, a platform that can be configured for 3D breast imaging – pending approval by the FDA. You are invited to stop by to learn more about Hologic's solutions for breast MR and Aegis™ image analysis technology as well as the latest advances in body composition analysis, osteoporosis screening capabilities and the visualisation of abdominal aortic calcifications on one system, Discovery™. The booth will be located this year at Hall A in the RSNA South Building.

**CARESTREAM**

Brest Regional University Hospital in Western Brittany, France, has purchased a CARESTREAM DRX-Evolution following a study into existing equipment at the hospital and an analysis of future needs for their 24-hour emergency facility. Following installation of the DRX-Evolution, the number of examinations is said to have risen from 1,500 per month to more than 2,000. The client states that the technology of the detector offered by Carestream Health proved attractive as it provided the best compromise between mobility and weight as a wired detector was thought too restrictive, especially for an emergency facility.

The ability to carry out a "direct" hand examination, simply by extending the bucky from the table was also important, as was the use of the rail mounted wall stand detector for on-table profile examinations which involves minimal movement of the patient while maintaining excellent image quality.

**SIEMENS**

Royal Preston Hospital has installed two ACUSON S2000™ diagnostic ultrasound systems from Siemens Healthcare for obstetric ultrasound. The new equipment delivers superb image quality allowing the ultrasound team to conduct more detailed patient scans for better interpretation and diagnosis. The ACUSON S2000 is an easy-to-use solution, which produces high quality images, with the additional functionality of eSieScan™ workflow protocols, which save valuable time and keystrokes by automating routine tasks. Royal Preston Hospital is using the system for nuchal translucency screening in the first trimester of pregnancy. The system design aims to reduce the amount of repetitive strain injuries suffered by users as the ergonomic design features the most frequently used controls within easy manual reach.

## EUROPEAN NEWS

# CROSS-BORDER REIMBURSEMENT

## Legislative Clarifications Set Out

By Rory Watson

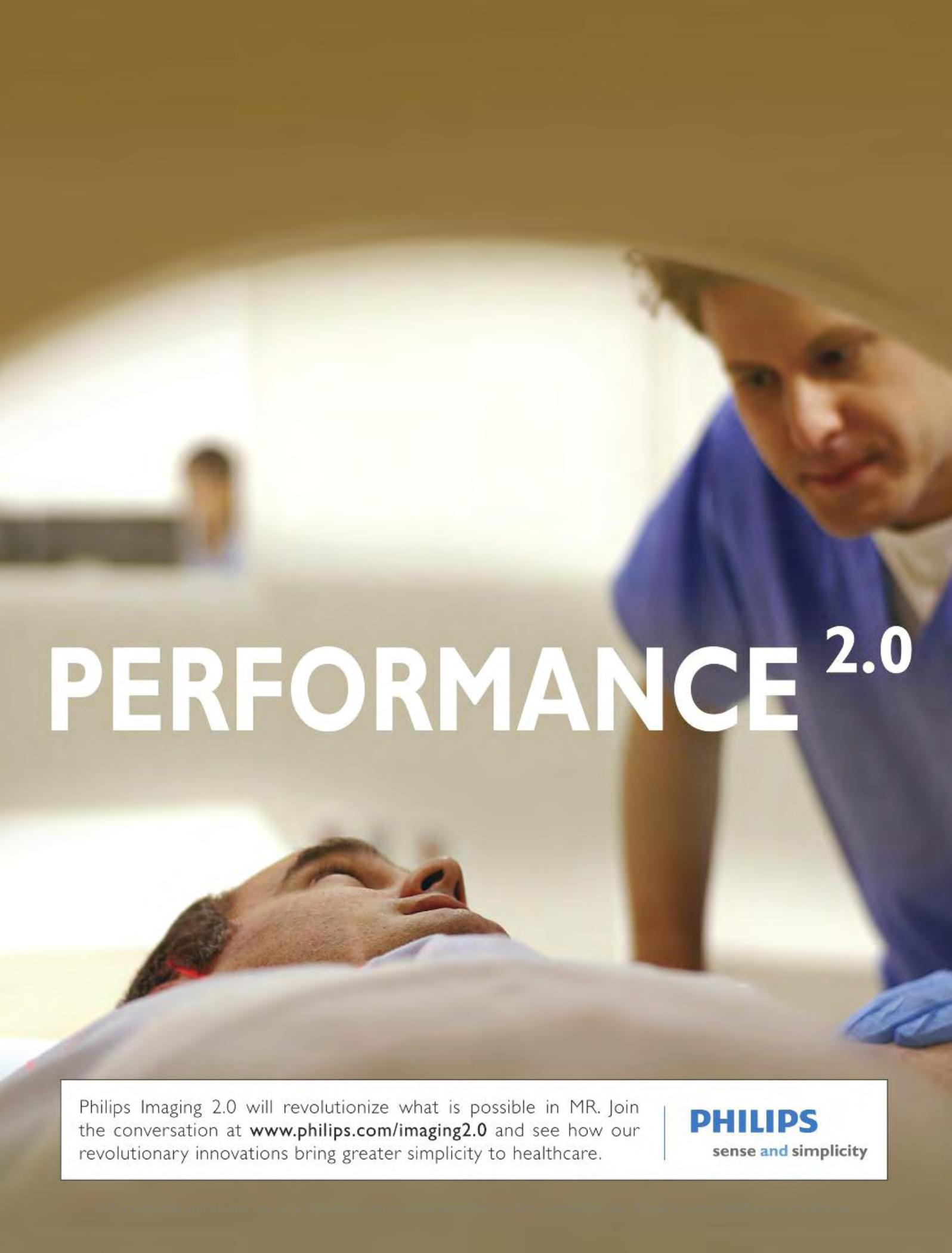
Pan-European legislation clarifying the conditions under which patients may be reimbursed for healthcare they receive in another EU country has moved a significant step closer to its final adoption. In mid-September, EU governments formally set out their proposals that are designed to strike a balance between an individual's right to

cross-border healthcare and the ability of national authorities to organise their own healthcare systems.

As a general principle, patients may be treated abroad and reimbursed up to the level they would have received for the same or similar treatment in their national health system. However, a government may limit

application of the reimbursement rules if it believes overriding interests of general interest exist, such as the danger of seriously undermining the balance of its social security system.

National authorities would also be able to manage the outward flow of patients by requiring prior authorisation for healthcare,



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which involves overnight hospital accommodation, or highly specialised and cost-intensive medical procedures or gives rise to concerns over the quality and safety of the care.

Similarly, countries receiving incoming patients would be able to take measures to en-

sure that their health facilities are not overwhelmed by the extra demand to the detriment of their own nationals. At the same time, they would be responsible for establishing national contact points to provide patients from other countries with the

necessary information on safety and quality standards to enable them to make an informed choice. The draft legislation now passes to the European Parliament, which is likely to introduce further amendments in the near future. ■

# THE MONITORING NATIONAL E-HEALTH STRATEGIES STUDY

## Results Show Positive Steps Taken

"Europe is leading the rest of the world in advancing towards modern e-health infrastructures and implementations" was the conclusion of Dr. Karl Stroetmann of empirica Consultants at an e-health Strategies Symposium in Brussels.

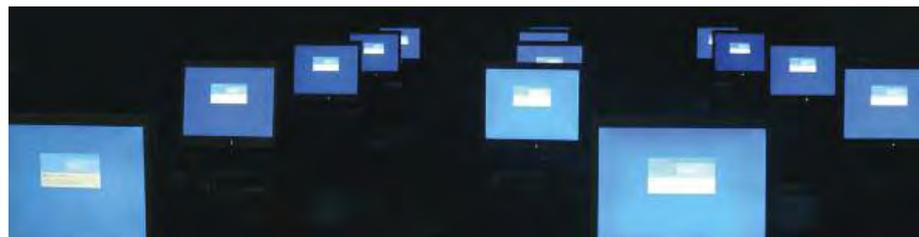
This is a field where Europe has achieved and even overachieved its Lisbon Strategy goals. Results of the Monitoring National e-health

prescriptions and the provision of telehealth services for doctors and patients in remote regions or for chronically ill patients at home. These are among the key activities identified in our 2004 e-health Action Plan. We are happy to see that the development of this Lead Market Initiative, which we have supported for many years, is gaining such momentum."

Compared to four years ago, when Member States had published only high level official policy documents or roadmaps, now almost all EU and EEA Member States have detailed documents outlining concrete e-health goals, implementation measures and past achievements.

The results of the Monitoring National e-health Strategies study reveal that reaching agreements with regards to e-health strategies and, to a greater extent, implementation of these strategies across Europe have proven to be much more complex and time-consuming than initially anticipated. In addition, the complexity of e-health as a management challenge has been vastly underestimated. It is evident that further exchanges of information on national and regional experiences are needed; both in relation to successes and failures, and that these lessons learned may prove particularly beneficial to e-health in Europe as a whole.

Many challenges remain and there are many obstacles yet to be overcome: Issues of legality, semantic interoperability, standardisation and electronic identification domains must be resolved before these services can be regarded as truly Europe-wide and accessible to every citizen. Luc Nicolas from the Belgian Federal Public Health Services underlined that all Member States therefore "Strongly support the recently established e-health Governance Initiative of European countries intended to tackle these and other issues at the highest political level!" ■



Strategies study ([www.ehealth-strategies.eu](http://www.ehealth-strategies.eu)) presented on Sept. 16, 2010 in Brussels, show that virtually all Member States of the European Union have either already begun or will begin shortly to undertake the implementation of national systems making basic patient data available to all healthcare professionals whenever and wherever needed.

While patient summary and Electronic Health Record (EHR)-like systems have already been high on the agenda for some time, most Member States (+16) now realise that there is an urgent need for (continuous) evaluation activities, both to better control policy progress and learn from challenges and experiences.

Ilias Iakovidis, Deputy Head of the ICT-for-Health Unit of the European Commission, which ordered this survey, noted "Services high on the agenda are the electronic transfer of

Another indication of the strong political commitment at the national policy level is the growing establishment of permanent administrative support structures. National competence centres like Gematik, Germany's Society for Telematic Applications of the Health Card in Berlin; ASIP, France's Agence pour les Systèmes d' Information de Santé Partagés in Paris; and THL, Finland's National Institute for Health and Welfare in Helsinki are increasingly used models of organisation.

More than 100 high level political representatives from European Ministries of Health, representatives of stakeholder associations and European policy institutions attended the workshop which showcased several good practice cases of Member States e-health strategies and highlighted the overall trends across Europe with regards to e-health initiatives and implementation.

For more information, please visit [www.ehealth-strategies.eu](http://www.ehealth-strategies.eu)

A healthcare professional in a white lab coat is looking at a young child in a hospital setting. The child is wearing a white shirt with colorful animal and nature patterns. The background is a blurred hospital environment.

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# INFORMED CONSENT FOR INTERVENTIONAL RADIOLOGY PROCEDURES

## Dream or Reality?



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As interventional radiology develops as a specialty, the issue of informed consent is becoming more important and in many cases more complex. The doctrine of informed consent relates to the right of every competent adult to decide what will happen to his or her body, and to protect one's bodily integrity from unauthorised intrusions. This encompasses every action by a physician ranging from a simple physical examination to a complex surgical procedure. Implied consent is the term used to describe how patients consent to everyday patient-physician interactions that are without risk. For example, implied consent is assumed when a patient proffers his or her arm in order to have blood pressure measured. Different standards apply when more complex procedures and treatments are undertaken.

### Litigation & Patient Consent

Many of the legal cases relating to the definition of informed consent have taken place in the United States. *Mohr v. Williams* (1905) involved a surgeon who, during an operation, determined that the patient's left ear was diseased and operated on it although that patient had consented for an operation on her right ear. Hearing in the left ear had deteriorated and the court found that the physician was guilty of battery by operating without consent. The judgment described valid consent where "a physician advises a patient to submit to a particular operation, and the patient weighs the dangers and risks incident to its performance, and finally consents." This established the idea of informed consent as a full decisional process.

CIRSE, the European Society for Cardiovascular and Interventional Radiology, has published recommendations on informed consent. These state that details of the proposed treatment, common and serious side effects and the probability of success should be discussed with the patient, who should be made aware of alternative treatment options available. Should all possible risks or adverse effects be discussed, no matter how unlikely? Current guidelines from the Irish Medical Council require the disclosure of all significant risks or substantial risks of grave adverse consequences. The General Medical Council (GMC) in the UK advises that patients

must be told if an investigation or treatment might result in a serious adverse outcome, even if the likelihood is very small. They should also be told about less serious side effects or complications if they occur frequently.

On occasion, a patient may indicate that they do not wish to be informed about the proposed treatment and its risks. While their wishes should be respected, the physician should explain the potential consequences of their lack of information and that the patient's consent may not be valid. The physician should record the fact that the patient has refused this information and should make it clear that the patient may change their mind and receive more information at any time.

### Gaining Consent for Interventional Procedures

There are certain issues that arise concerning informed consent for interventional radiology procedures. Informed consent should always be obtained before the procedure and the best setting for this is in a preprocedural outpatient clinic. However in a 2003 survey, only 22 percent of European interventional radiologists generally obtained consent in the outpatient clinic. As interventional radiology moves further towards becoming an independent clinically based specialty, it is likely that use of outpatient clinics will increase.

If consent is being obtained after the patient has been admitted, this should be done on the ward on the preceding day. If obtaining consent in the interventional suite, the radiologist should ensure that the patient has their reading glasses with them if required so that they may read the consent form. Consent should always be obtained before sedation is given.

### Who Should Obtain Consent?

This leads to another issue – who should obtain consent? The patient's consent should be obtained by the operator who is to perform the procedure. This responsibility may be delegated to a suitably trained and qualified physician who has sufficient knowledge of the proposed treatment and understands its risks. In addition, guidelines from the General Medical Council advise that the delegating physician must ensure that the patient has been given enough

time and information to make an informed decision. In this context, it is worth pointing out that obtaining informed consent is a dynamic process involving discussion with the patient. While the patient's signature on a consent form may be evidence of that discussion, it does not in itself mean that informed consent has been obtained.

The primary purpose of the consent form is to provide written information to the patient in addition to a verbal discussion. Currently in the author's hospital, a generic consent form is used (see fig. 1, p. 14). A similar form was used by 83 percent of European radiologists in one study. However, a recent Eurobarometer patient survey found wide variations in the use of consent forms prior to surgical procedures. Written consent was obtained in 90 percent of cases in Germany but in only 56 percent of cases in Finland and 46 percent of cases in Greece. It is reasonable to suppose that similar variations may exist in radiology departments. Many radiologists write the side effects and potential complications of the procedure on the form that have been discussed with the patient.

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**“The patient may be regarded as lacking the capacity to give consent if they cannot understand or retain the information provided, if they are unable to apply that information to their own circumstances and come to a decision or if they are unable to communicate their decision.”**

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An alternative is to use customised forms containing information unique to the procedure recommended. This practice is to be encouraged as it provides additional information for the patient and may save time for the radiologist. It also offers an opportunity to standardise the consent process at a local, national or even international level. CIRSE has published quality improvement guidelines on many interventional procedures. These detail typical complications and their rates, and provide a useful source of information.

### **Importance of Informational Leaflets**

Information leaflets are another important resource in informing the patient. 61 percent of European radiologists provide information sheets relating to the procedure to their patients. These should be made available to the patient as



far in advance of the procedure as possible. To facilitate this, they should be provided in the outpatient clinic and on the ward. Increasingly, patients are turning to the Internet to learn about their own conditions and proposed treatments. CIRSE has developed a “Patients and Public” section on its website that provides information on many interventional radiology procedures.

In the United States, the Society of Interventional Radiology provides similar information on its website. A comprehensive collection of leaflets prepared by the Royal College of Radiologists and the British Society of Interventional Radiology are available for download from the RCR website. Where available, specialist nurses may also have a role in educating patients in advance of their procedure.

Interventional radiology procedures are often open-ended and the therapeutic option chosen may vary depending on the initial imaging acquired during the procedure. It is therefore important to discuss with the patient all options and scenarios that may arise during the procedure. Consent must be obtained beforehand if treatment is to be undertaken. For example, if a femoral angiogram identifies a stenosis, the radiologist must not proceed to angioplasty without the patient's prior consent.

### **When the Patient's Capacity to Understand is Diminished**

Problems may arise where the patient's capacity to give consent is affected by infirmity. There are currently no pan-European guidelines or legislation governing this complex area. It is the responsibility of each radiologist to be aware of the legislation and ethical guidelines operating in their jurisdiction. The Irish Medical Council advises that each patient

The image shows two pages of a consent form. The left page is the main body of the form, and the right page contains additional questions and a signature section. The form is from Beaumont Hospital and is titled 'CONSENT FORM'. It includes fields for patient name, hospital number, and ward. The text explains the nature and purpose of the operation, the use of tissue samples for diagnosis and research, and the risks of the procedure. There are sections for patient consent, a signature line for the patient or guardian, and a signature line for the medical practitioner. The form also includes a date field and a section for the medical practitioner's name and team.

Figure 1:

A generic consent form

should be assessed on a functional basis regarding their capacity to consent.

The patient may be regarded as lacking the capacity to give consent if they cannot understand or retain the information provided, if they are unable to apply that information to their own circumstances and come to a decision or if they are unable to communicate their decision. A judgment that a patient lacks the capacity to make a particular decision does not imply that they are unable to make other decisions or will be unable to make this or other decisions in the future.

In this situation, the next step is to find out whether any other person has legal authority to make decisions on the patient's behalf. If so, that person's consent should be sought. Failing that, the radiologist must decide what treatment to provide. Consideration should be given to the patient's past and present wishes if they are known, whether the patient's capacity is likely to increase, the views of other people close to the patient who may be familiar with the patient's preferences, beliefs and values, and the views of other health professionals involved in the patient's care.

What of the situation where an interventional radiologist is asked to perform an embolisation to achieve haemostasis in an unconscious trauma patient? In this type of emergency situation where a patient is seriously ill, they may not be able to give consent. Medical treatment should be provided as

needed but should be limited to what is immediately necessary to save life or avoid significant deterioration in the patient's health. The treatment provided should be the least restrictive of the patient's future choices. If the patient regains capacity while in the radiologist's care, they should be informed of what has been done and the reasons for doing so.

### Planning for the Future

How should interventional radiologists plan for the future with regard to informed consent? Increasingly complex procedures will require informed consent well in advance. The interventional radiologist should meet patients in the outpatient clinic. Imaginative use of resources such as DVDs and multimedia web-based presentations will supplement traditional information leaflets. The radiologist must keep abreast of changes to legislation and ethical guidelines in their own jurisdictions, especially regarding the issue of capacity to consent. More aggressive measures to prolong life will be accompanied by increasing use of advance treatment plans. A consensus on complication rates and standardisation of the consent process will be led by the relevant societies. ■

*A full list of references for this article is available on request to the Managing Editor at [editorial@imagingmanagement.org](mailto:editorial@imagingmanagement.org)*

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# THE RADIOLOGICAL IDENTITY CRISIS

## Patient Unable to Differentiate Radiologists from Technologists



Interviewee  
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Chairman  
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Reporter  
Dervla Gleeson

Managing Editor

Some worrying conclusions can be drawn from the research of Prof. Lorenzo Derchi and his team at the department of radiology in Genoa, Italy, concerning the relationship between radiologists and patients. Paramount to this is their ongoing work exploring not only what patients think of the radiologist, but whether they even recognise which of the medical team they meet with during their exam, is the actual radiologist.

Prof. Derchi states that “Medical imaging is growing in significance in medicine, as physicians increasingly rely on imaging findings as a key part of the clinical examination of the presenting patient. Patients, too, have great trust in medical imaging; they more and more often go to their own family doctor asking not to be examined by him, but to be referred to an imaging examination. The referring physician then contacts the radiologist to perform the exam. However, in most cases, the radiologist is not in the actual room during the patient’s exam, but in another room in front of the monitor of his/her workstation reading images. So, though patients rely on imaging to assist in diagnosis, there is great distance between patient and radiologist”.

He continues, “There is a sort of factory mentality in the organisation of workflow that has developed in response to the explosion in the number of imaging studies being requested, which calls for efficiency and cost-control rather than greater recognition of the intrinsic value of patient-radiologist contact. Imaging departments are often regarded as “examination factories” and not as clinical services. In this interview, Prof. Derchi explains his findings in this re-

gard and explains why radiologists need to interact with their patients.

### Patients Vs. Citizens & Politicians

Prof. Derchi draws attention to the dichotomy between a patient’s desire for personal contact with their specialist, and the drive for efficiency: “Politicians and citizens alike want radiologists to spend tax funds efficiently on health-care and imaging. In this situation, efficiency itself is regarded as the desired goal. On the other side, patients wish radiologists to be as human as possible – to show attention and care to the person as well as the image.” When they are healthy, medical imaging is perceived by people in one way – when in need, it is viewed in quite a different light.

In their report, entitled “How often do patients ask for the results of their radiological studies?”, Prof. Derchi and his team made a study of outpatients in their radiology department in Genoa, where they monitored how many patients were asking the radiologist or technician for immediate feedback after their imaging exam (1). 1,171 outpatients underwent CT (382) ultrasonography (384), or MR of the extremities (405). The first of three groups studied were undergoing CT exams, which was performed by technologists and nurses. In this case, the radiologist was only visible to the patient if there was the need for informed consent for the use of contrast agents.

In the second group, who were undergoing ultrasound, this was performed by an actual Board-certified radiologist.

# New, non-surgical treatment for uterine fibroids

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High Intensity Focused Ultrasound (HIFU) has long been known as a non-invasive therapy technique. It uses focused ultrasound waves to heat and coagulate tissue deep inside the body without damaging intervening tissue. However, the lack of a suitable guidance and monitoring technique and long treatment times has prevented its widespread medical use.



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the skin and intermediate tissue unharmed. Within a few seconds this produces a well-defined region of coagulative necrosis.

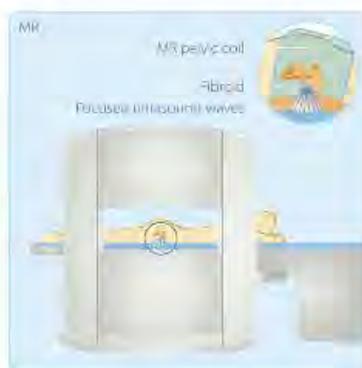
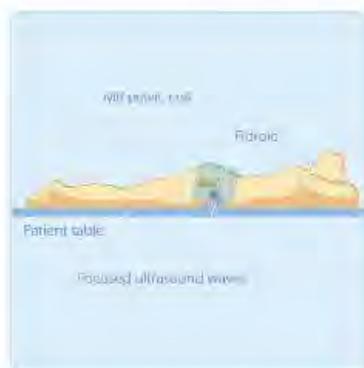
### Combined with MR image guidance

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### Ablation of uterine fibroids

Uterine fibroids are the most common benign tumors in pre-menopausal women. Fibroids occur in 20 to 50% of women of child-bearing age, and with increasing size produce pain, excessive menstrual bleeding,

pressure, bloating and urinary and bowel compression symptoms. Fibroids may also cause infertility. Many women suffer from uterine fibroids but don't want to undergo surgery and continue to endure the condition in silence. Philips' new Sonalleve MR-HIFU system now offers a non-invasive treatment of uterine fibroids. The technique is much more convenient and comfortable than other therapeutic procedures such as hysterectomy, myomectomy or uterine artery embolization. These require hospital admission as an in-patient and sometimes weeks of recovery. In contrast, with Sonalleve fibroid therapy, patients can be treated as an out-patient, be out of the hospital the same day and almost fully recovered within a few days.



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In the third group, who were undergoing MR exams of the extremities, these were performed by physicians residents in training to become radiologists and then reviewed afterwards by a specialist. In both these groups this was followed by direct patient/physician interaction and dialogue. Results showed that more than 50 percent in the ultrasound and MR patient groups and only 23 percent in the group undergoing CT asked for more communication as to the results of their exam - from anyone in the room, not specifically the radiologist.

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**“Patients were unable to differentiate radiologists from technologists in the department. Many who only have contact with the technologist assume that he/she must logically be the radiologist, since he/she is working with the equipment.”**

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From this, Prof. Derchi and his co-researchers conclude the following: “If we communicate with our patients as physicians, they will treat us as physicians. They will enquire about their health just like with any other doctor”. Prof. Derchi states that “Traditionally, radiologists receive a request from the referrer, and give the answer to the referrer and not the patient. The referrer is the physician to whom the patient will look for further information. There are a number of papers that focus on the role of communication skills in radiology, and all agree that direct contact with patients is important. We must learn how to talk with them, even when bad news has to be given. As for outpatients, it is becoming recognised that communication of the results has to be given directly to the patients, and not only to their referring physician (2)”. Indeed, the conclusion of this study is that “We believe these results show the importance of the direct doctor-patient relationship during radiological studies. Communication, time to talk and provision of information are probably the most important things patients want from their doctors. Our study suggests that this is also relevant in radiology and, when given the opportunity to meet the radiologist, patients appreciate the interaction (1).”

#### **What can we Conclude?**

Prof. Derchi is philosophical about any potential resolution to this schizophrenic view of the act of medical imaging: “Maybe the first step is not to obsess about efficiency to the

point of excluding patients from our daily working lives. When we are looking at our workload with a view to patient scheduling, perhaps some time should be allocated for interacting with patients, not simply for when informed consent is required. Communication should be an integral part of workload planning – reading an exam can only be enriched by increased knowledge about a patient that comes from speaking with them about their condition. And patients will possibly feel reassured at seeing the 'man or woman behind the machine'.” He restates that “Medical imaging is growing more and more important in clinical practice, overall. However, the role of the radiologist physician is becoming simultaneously less visible. We need to find ways to increase our visibility. We can do this by:

1. Introducing ourselves to the patient at the beginning of the exam;
2. Asking a few questions about why the patient is there, and
3. Considering the steps needed to make a complete radiological act and assessing where the radiologist can have more impact (a.) Justification for the exam b.) Plan the correct type of exam and protocol c.) Do the exam d.) Read the exam e.) Interpret it f.) Communicate the report to the patient, whenever possible, or the referrer).

With the growth of an increasingly factory-like mentality, we try to optimise time. When you realise that support staff such as clerks and technologists are already doing quite a portion of the above outlined steps, then the radiologist is in danger of becoming invisible. “In ultrasound, you see the patients, which adds context to the examination procedure.” Worryingly, Prof. Derchi adds that “In our new research, we asked patients what they think about radiologists. It arose that patients were unable to differentiate radiologists from technologists in the department. Many who only have contact with the technologist assume that they must logically be the radiologist, since they are working with the equipment. This is a risky state of affairs for the professional recognition of the work of a radiologist, and a worrying symptom for the future if no action is taken”. ■

#### *Further reading*

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2. Berlin L. Communicating results of all outpatient radiologic examinations directly to patients: the time has come. AJR 2009; 182:571-573



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# MANAGING DISTRESS, DISCOMFORT, AND ANXIETY IN IMAGING



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It was once thought that physicians become radiologists because they didn't want to interact with their patients. In the joke "How do you hide a 100 dollar bill from a doctor?" the answer pertaining to the radiologist is "You pin it on the patient." But times have changed. Today, radiologists are at the critical interface between diagnosis and treatment, a time when patients and referring clinicians have questions, demands, and are in need of guidance.

Positive patient interactions and experiences not only help the "customer" but also directly affect the bottom line. Anxiety related reactions, ranging from apprehension to inability to complete the test, affect between four and 30 percent of patients undergoing MRI (Melendez & McCrank, 1993). An estimated 2.3 percent of patients cannot complete their MRI scans because of claustrophobia, panic, or other reasons that prevent them from lying still (Dewey, Schink, & Dewey, 2007). This results in hundreds of thousands of dollars of losses every year for the involved facilities. Fortunately such waste of overhead can be limited by simply changing the way staff talks with patients (Lang, Ward, & Laser, 2010).

The promise of medications for distress management is no panacea. When the threshold to use anaesthesia is low, such as in paediatric imaging, it can create a bottleneck when availability of anaesthesia personnel is limited. For this reason – not scanner capacity - waiting times for elective paediatric MRI are currently in the range of several months in Canada.

Another problem that good communication with patients can avoid is no-shows. Support by a communica-

tion-trained scheduler or judicious use of scripts can greatly ameliorate this challenge. It pays to have patients arrive with less anxiety: Otherwise their cases will take longer and be more painful (Schupp, Berbaum, Berbaum, & Lang, 2005).

## Litigation Headaches Linked to 'Absent' Physicians

Patients who feel their healthcare provider doesn't care are more likely to sue (Levinson, 1994). Malpractice attorneys cite communication issues as the primary reason for filing a suit in more than 80 percent of cases (Avery, 1985). These patients cite having information poorly delivered, and not being understood or valued as leading causes of dissatisfaction (Beckman, Markakis, Suchman, & Frankel, 1995). Responding to the public's frustration with poor doctor-patient relationships, the Accreditation Council for Graduate Medical Education now demands that all physicians be trained and are fluent in communication and interpersonal skills (Accreditation Council for Graduate Medical Education, 2001). Before embarking on such training one should, however, better understand the sources of patient distress and how they can be addressed efficiently.

## Causes of Patient Anxiety and Distress

Patient concerns may encompass possible adverse effects, cancer, pain, or poor outcomes. We measured the distress of 214 women in the radiology waiting room through the

# Tomosynthesis Improves Diagnosis and Localization of Tumors

## CASE STUDY: HÔPITAL PRIVÉ BEAUREGARD, MARSEILLES, FRANCE

The Hôpital Privé Beauregard in Marseilles is recognized throughout France as a center of expertise in mammography. The *Nouvel Observateur* recently rated it one of the top five hospitals in France for the management of breast disease. The private 320-bed hospital is part of Generale de Sante, the largest private hospital group in Europe, providing services to more than one million patients each year.

For the past 10 years, the hospital's Breast Imaging Center has set the standard for the detection of breast cancer by proactively offering screening mammograms. In 2009, the hospital again led the way with the addition of a Hologic Selenia® Dimensions® 3D digital tomosynthesis system, becoming one of only a handful of hospitals in France to implement this state-of-the art technology.

*"Tomosynthesis provides better visibility of the margins of a mass and increases our confidence in the diagnosis of benign images,"* reports Radiologist Brigitte Seradour, M.D., Head of the hospital's Breast Imaging Center and Coordinator of the French National Screening Program for Breast Cancer (INCa). *"Tomosynthesis will benefit women who have heterogeneous dense breasts with an opacity not typically well seen in two-dimensional imaging. It will help us detect masses in these patients because tomosynthesis slices are similar to histological sections of paraffin tissue, providing better visualization of cancerous tumors, particularly spiculated areas."*

Managing the department that takes care of the second readings for all screening examinations is one of Dr. Seradour's many responsibilities. This position allows her to monitor the evolution of mammography image quality from screen-film to different digital mammography solutions.

Dr. Seradour says excellent image quality and ease of use were key factors in the hospital's choice of the Hologic tomosyn-

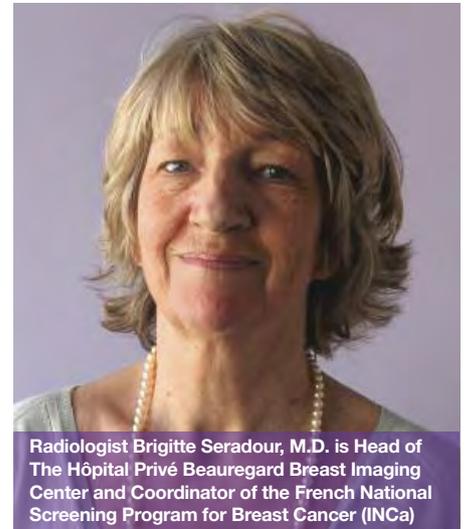
thesis system. The system's combined 2D + 3D functionality also played a critical role. *"The Selenia Dimensions is the only tomosynthesis system that enables technicians to take both two-dimensional and three-dimensional images in a single acquisition with a single compression,"* states Dr. Seradour.

**"Tomosynthesis provides better visibility of the margins of a mass and increases our confidence in the diagnosis of benign images."**

### Tomosynthesis Enables 3D Reconstruction of the Breast

*"Tomosynthesis deals easily with the superposition of breast tissue, so we are able to decrease the number of spot views we take by 80 percent."* The Hôpital Privé Beauregard performs 8,000 mammograms annually using CR, and a Hologic Selenia and Selenia Dimensions system. Since implementing tomosynthesis, the Breast Imaging Center has performed 6,000 mammograms using the unique 2D + 3D functionality of the Hologic system. Dr. Seradour and her staff use tomosynthesis as an additional modality to two-dimensional imaging.

Dr. Seradour reports that the three-dimensional tomosynthesis images have helped detect eight cancers that would not have been seen with two-dimensional



Radiologist Brigitte Seradour, M.D. is Head of The Hôpital Privé Beauregard Breast Imaging Center and Coordinator of the French National Screening Program for Breast Cancer (INCa)

mammography. *"The tomosynthesis system removes overlays that can hide small cancers, especially if the breast is very dense and opaque."*

For patients and technicians there is little difference in the examination or workflow. *"Our patients don't see any difference with the tomosynthesis mammogram; they are just curious and ask why the tube is rotating,"* says Dr. Seradour. *"Our workflow hasn't changed either. It doesn't take any longer to read cases."*

In conclusion, she says: *"I think tomosynthesis has an important impact in screening mammograms. It detects multifocality better and will avoid a lot of false negatives; we can see more, so opacity will not be wrongly classified as benign."*

*This case study focuses on the clinical experiences of a Hologic customer. The opinions expressed are not necessarily that of Hologic.*

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analysis of extensive questionnaires (Lang & Flory, 2010). Women awaiting breast biopsy had significantly higher levels of anxiety and perceived stress than women awaiting much riskier procedures, such as chemoembolisation for known liver cancer. They also experienced depressive moods and impact on daily life comparable to those of the cancer patients. Stress levels didn't differ among women coming for embolisation of benign fibroids and those coming for embolisation of cancer. These results identify not knowing the diagnosis as a highly potent stressor. Uncertainty of diagnosis during the wait for final results can even disturb cortisol secretion to a degree similar to that of patients who learned they have cancer (Lang, Berbaum, & Lutgendorf, 2009; Gustafsson et al., 1995).

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**“Handing the patient a “panic” button in MRI sets the stage for what to expect. Pain can be insinuated by just mentioning its possibility.”**

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The distress of patients can be further aggravated by the reactions of the attending facility personnel. Patients who come for examinations or procedures are in a highly suggestible state which makes them vulnerable to a pessimistic interpretation of the information they receive (Ewin & Eimer, 2006). Words, tone, expressions, and context determine if the information creates positive or negative expectations (Bayer, Coverdale, Chiang, & Bangs, 1998). Negative expectations bring about negative outcomes (Silvestri et al., 2003; Spiegel, 1997).

Handing the patient a “panic” button in MRI sets the stage for what to expect. Pain can be insinuated by just mentioning its possibility, as has been shown in a study where volunteers who expected pain, reported pain, even when there were no painful stimuli (Bayer et al., 1998). In an interventional radiology study, negatively-valenced statements (e.g. “just a sting and burn”), as compared to none at all or to neutral ones, increased patients’ anxiety and pain when used to announce upcoming stimuli (Lang et al., 2005). Fortunately, it is easy to avoid negative outcomes by simple changes in vocabulary. “I will give you the local anaesthetic,” or “I will give you the numbing medicine” will do just fine.

Paradoxically, things can actually become worse when medical personnel want to be particularly nice but are not trained how to express their empathy in a way that helps patients help themselves: Under these conditions haemodynamic disturbances and adverse events can become sig-

nificantly more frequent in interventional radiology and further stress the patient (Lang et al., 2008).

### **How to Address Patient Anxiety And Distress**

Radiology is a haven of technology. The recourse to fight patient distress with technology is appealing: creating a more patient friendly atmosphere through the lay-out, colouring, placement of art and pictures, offering more “open” equipment design, earplugs for sound suppression, headphones for listening to music, blindfolds or video-goggles for blocking out reality. Technology, however, weighs on the budget and cannot replace the human element that many patients clamour for to overcome their stresses.

Spending more time with patients is not necessarily the answer. Even when doctors take extra time and think they are making special efforts in giving more information and explanations this may not result in greater patient satisfaction (Ley, Bradshaw, Kinsey, & Aterton, 1976). One reason resides in the following dynamics (Suchman, Markakis, Beckman, & Frankel, 1997): Patients seldom verbalise their emotions directly; they tend to offer clues instead. When healthcare providers respond to this emotional appeal accurately and acknowledge the patients, communication proceeds smoothly. When healthcare providers return to the preceding topic or sentence sequence, patients remain unsatisfied. Some patients may raise the issue again and again with escalating intensity. Patients who want attention will ultimately get it – which may be at most inopportune times when their attention seeking behaviour disrupts a procedure or a scan. It is thus far more preferable to respond to the patients’ needs early on.

Over the past 20 years we worked on and tested solutions that rapidly diffuse patient distress and help patients with painful radiological procedures. We focused on non-pharmacologic methods and started to train healthcare professionals in a more patient-centred talking style, complemented with hypnotic language that directly addresses anxiety, pain and distress. It was important that methods would not require prior patient preparation or selection, any props, or extra time, but could be integrated in routine workflow. Therefore it was important to include rapid rapport skills and ways to positively shape the patients’ experience right from the start. We summarised the techniques in a book “Patient sedation without medication. Rapid rapport and quick hypnotic techniques. A resource guide for doctors, nurses, and technologists” (Lang & Laser, 2009). The emphasis of our approach is helping patients help themselves and using what comes naturally. Quirk et al. found that many MRI patients combatted anxiety on their own



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by using breathing and relaxation techniques, visualising pleasant scenes, and performing mental exercises (Quirk, Letendre, Ciottono, & Lingley, 1989). This type of focused attention on a more pleasant outlook than the immediate surrounding reality is the essence of self-hypnosis. We evolved the concept of guidance in self-hypnotic relaxation in radiology and showed efficacy in three large prospective randomised clinical trials: in the “Lancet Study” testing applicability with concurrent access to IV conscious sedation during vascular and renal procedures; in the “Breast Trial” during large core breast biopsy in a pure outpatient model, and the “Tumour Embolisation Trial” as a model for more invasive therapy with high complication potential (Lang et al., 2000; Lang et al., 2006; Lang et al., 2008).

Patients had less pain, less anxiety, fewer medications, and fewer complications. Being able to increase haemodynamic stability and outcomes came as particularly valuable side effects – not negligible in a climate of mandated safety initiatives, Pay-For-Performance, and trends towards open “Report Cards”. Use of these methods resulted in the considerable savings of 338 dollars per case in the catheterisation laboratory (Lang & Rosen, 2002).

Over the years we came to learn that it “takes a village” to have a smooth transition in how communication is used throughout the department. We have developed a method of patient interaction called Comfort Talk™ in which schedulers, receptionists, nurses, technologists, and physicians are extensively trained in advanced rapport skills and setting expectations. A core group of healthcare professionals then provides additional guidance in self-hypnotic relaxation. We used this model when we were asked to help a large private MRI practice. After team training, the non-completion rate of MRIs was reduced by 40 percent and resulted in annual savings of 140,000 dollars, with maintained success at the time of a one-year follow-up (Lang, Ward, & Laser, 2009).

### **Hypnotic Language in the Modern Healthcare Environment**

Although successful use of relaxation and hypnotic techniques in radiology, mainly MRI, dates back to the 80’s, these methods received surprisingly little attention (Friday & Kubal, 1990; Klonoff, Janata, & Kaufman, 1986; Quirk, Letenre, Ciottono, & Lingley, 1989). Main impediments were early beliefs that such techniques are best provided by mental health professionals, and that traditional hypnotic techniques and desensitisation approaches just took too long for a busy practice. The beliefs are changing. It has become apparent that guidance in self-hypnotic relaxation on the examination table can be applied without interruption of workflow and that personnel already involved can perform it expertly (Lang & Berbaum, 1997).

Openness towards and usage of alternative approaches has made great strides with the public (Eisenberg et al., 1993). More and more traditional medical institutions are opening alternative centres to respond to the need. The press is extensively reporting positively about use of such methods ([www.hynalgescics.com\\_professionals\\_news](http://www.hynalgescics.com_professionals_news)). The balance has swung far towards Comfort Talk™ type interventions, which smooth communication and help patients through a stressful time, improve outcomes, and give patients the assurance of caring and the respect they seek. In our experience, patients appreciate the effort made to help them through their examinations. Informed patients will choose their healthcare facilities based on whether they can receive this kind of assistance and will shun places that are hostile to the concept. With patient expectations rising, it makes sense to train one’s radiology team in advanced communication. ■

*A full list of references for this article is available on request to the Managing Editor at [editorial@imagingmanagement.org](mailto:editorial@imagingmanagement.org)*

# First Hospital in the UK Trials using 3D Imaging for Breast Cancer Screening

## NEW TECHNIQUE COULD SAVE 12,000 UK LIVES A YEAR

**Breast tomosynthesis, a new three-dimensional (3D) digital x-ray technology for breast cancer screening and diagnosis, is being trialled at King's College Hospital (London, UK), the first national hospital in the UK to undertake this kind of trial. If successful, 3D breast imaging could offer new hope in the fight against breast cancer.**

**King's College Hospital is one of the UK's largest and busiest teaching hospitals, with over 6,000 staff assisting approximately 700,000 patients a year.**

With approximately 46,000 women diagnosed with it and causing over 12,000 deaths in the UK each year, breast cancer is the most common cancer in the country. This trial will hopefully prove that 3D technology can assist doctors in reducing the numbers of not only the estimated 70 – 80,000 women every year who are wrongly told that something unusual has been found, as well as the small number of women mistakenly given an all-clear.

The system used in the trial is a Hologic Senia® Dimensions® breast tomosynthesis system, now commercial in Europe and other areas of the world and in the process of gaining FDA approval in the US.

### 2D Imaging Shows Room for Improvement

At present, two-dimensional (2D) mammography is the standard breast x-ray

used in the UK. Although recognised as safe and reliable in detecting the early signs of cancer, the so-called 'anatomical noise' associated with 2D imaging can sometimes hide cancers, or produce shadows that falsely create the suspicion of cancer. The new technology at King's enables doctors to look at separate 'slices' of the breast. Some cancers remain undetectable with 2D technology. The trial hopes to prove the efficacy of 3D in overcoming this deficiency.

Dr Michael Michell, Director of Breast Screening at King's, has this to say about the developing technology:

*"This is exciting new technology, which could improve the accuracy of breast cancer screening and help save more lives by detecting more breast cancers when they are small and at an early stage, when they can be more effectively treated."*

*"In human terms this technology could spare a lot of women a lot of heartache, and also save the NHS [National Health Service] valuable resources through people not having to attend follow-up appointments and undergo further tests,"*

Mrs. Sarah Sellars, Assistant Director of NHS Cancer Screening Programmes, added:

*"The NHS Breast Screening Programme welcomes research into the use of new technology for screening and we await the outcome of this study with interest"*

The trial use of digital breast tomosynthesis at King's has been authorised by the hospital's Ethics and Research and Development committees. The clinical results of the trial at King's will be considered by the NHS Breast Screening Programme.

### 2D Versus 3D Imaging

Breast tomosynthesis is a three-dimensional imaging technology that involves acquiring images of a stationary compressed breast at multiple angles during a short scan. The individual images are then reconstructed into a series of thin high-resolution slices that can be displayed individually or in a dynamic ciné mode.

Reconstructed tomosynthesis slices reduce or eliminate the problems caused by tissue overlap and structure noise in single slice two-dimensional mammography imaging. Digital breast tomosynthesis also offers a number of exciting opportunities including improved diagnostic and screening accuracy, fewer recalls, greater radiologist confidence, and 3D lesion localisation.

*This case study focuses on the clinical experiences of a Hologic customer. The opinions expressed are not necessarily that of Hologic.*

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# MANAGING CLINICAL COMMUNICATION FOR PATIENT SAFETY: THE PACT PROJECT



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The clinical handover process is an integral component of patient care. Communication between clinicians regarding a patient's condition, treatment plan and care is directly related to the quality of health outcomes and systems success. Poor communication has been implicated as the leading cause of medication errors, delays in treatment, perinatal deaths and injuries, patient falls and wrong site surgeries. A study by the Joint Commission on Accreditation of Healthcare Organisations in the United States found that communication errors were the root cause of almost 70 percent of all sentinel events, with 75 percent of patients involved dying.

Effective communication is a complex concept requiring skill, insight, cognition and understanding. Although used frequently in day-to-day care, it remains a skill that must be learned, practiced and refined by all clinicians. Healthcare providers need to learn how to communicate in a clear, concise and appropriate manner within hurried, noisy and frantic healthcare environments.

Variations and inconsistencies in handover practices together with an apparent lack of best practice guidelines contribute to increased risk for patients and interruptions to the continuum of care. With this in mind, the PACT project was designed to develop, implement and evaluate for improvements in clinical communication.

## The Setting

The project took place during 2008 in a regional, private hospital in south-eastern Australia. The 103 bed hospital provides acute inpatient and outpatient medical, surgical and mental health services to a predominantly rural catchment area within a radius of 150 km.

- There were particular challenges in this setting:
- No resident medical officers on site;
- Nurses have to communicate directly with specialists;
- Poor mobile telephone coverage, and
- High proportion of part time, on call and junior nursing staff.

## The PACT Project

The key objective of this project was to improve communication and increase patient safety by the development, implementation and evaluation of formalized tools and education processes for clinical handover. This initiative was entitled 'The PACT Project', to convey the essential elements of effective clinical handover.

**P - Patient assessment.** Nurses must have the skills to conduct an effective patient assessment, particularly for patients whose condition is deteriorating.

**A - Assertive communication.** Assessment findings must be communicated clearly and completely to other clinicians to ensure patient safety

**C - Continuum of care.** Patient safety must be maintained by the timely, accurate and complete transfer of responsibility for patient care from nurse to nurse and shift to shift.

**T - Teamwork with trust.** All health care providers regardless of their position and experience have the right to speak up and express their concerns or opinions about a patient in a trusting and respectful team environment.

A project team (the authors) was established to guide the development, implementation and evaluation phases of the initiative. A critical reference group (PACT champions) of seven experienced nurses from the wards met regularly with the project team. They promoted the project to ward staff and reported views and opinions of nurses on the floor back to the team.

The project team kept staff informed of progress through monthly PACT newsletters, posters and notice boards located in wards and the staff dining room. All project materials were coloured bright pink to provide a visual reminder of the PACT message.

## Baseline data

Questionnaires were designed by the project team to determine opinions of nurses and specialist doctors about the effectiveness of clinical handover and information exchange between nurses and other healthcare providers. In total, 49 nurses (response rate 54 percent) and 16 specialists (response

# AUTHOR GUIDELINES

## Content

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## Submission Guidelines

Authors are responsible for all statements made in their work, including changes made by the editor, authorised by the submitting author. The text should be provided as a word document via e-mail to [editorial@imagingmanagement.org](mailto:editorial@imagingmanagement.org). Please provide a contact e-mail address for correspondence. Following review, a revised version, which includes editor's comments, is returned to the author for authorisation. Articles may be a maximum 700 words per published page, but may include up to 1,500 words in total.

## Structure

Article texts must contain:

- Names of authors with abbreviations for the highest academic degree;
- Affiliation: department and institution, city and country;
- Lead authors are requested to supply a portrait photo (see specifications below);
- One contact name for correspondence and an e-mail address which may be published with the article;
- Acknowledgements of any connections with a company or financial sponsor;
- Authors are encouraged to include checklists, tables and/or guidelines, which summarise findings or recommendations, and
- References or sources, if appropriate, as specified below.

## Images

Main authors are invited to supply a portrait photo for publication with their article, as well as other images and visuals. This and any other rel-

evant images for publication with an article should be sent by e-mail as separate files (only high resolution images with 300dpi) and their order of placement in the article must be clearly indicated. Only the electronic formats `_.tif_` or `_.jpeg_` can be used for images, i.e. not Microsoft Word or PowerPoint. Images must be no smaller than 9cm x 9cm at 100% scale. Only images meeting these specifications can be published. If an image has been published before, permission to reproduce the material must be obtained by the author from the copyright holder and the original source acknowledged in the text, e.g. © 2004 Dervla Gleeson.

## Format for References

Please use the Harvard reference system. Citations within the text for a single author reference should include the author surname and year of publication; for a citation with two authors include both author surnames and year of publication; for more than two authors, include the first author surname followed by "et al." and the year of publication. Multiple citations should be separated by a semicolon, and listed in alphabetical order. Example of within text citation: (Marolt 2008; Marolt and Gleeson 2002; Miller et al. 2003).

The format for listing references in submitted articles should follow the Harvard reference system. Example of standard journal reference: Sydow Campbell, K. (1999) "Collecting information; qualitative research methods for solving workplace problems", Technical communication, 46 (4) 532-544. Readers will be provided with an e-mail contact for references, which will be kept on file and supplied on request. Authors are responsible for the accuracy of the references they cite.

## Acceptance

It is at the discretion of our editorial board to accept or refuse submissions. We will respond to submissions within four weeks of receipt. We reserve the right to revise the article or request the author to edit the contents, and to publish all texts in any EMC Consulting Group journal or related website, and to list them in online literature databases.

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*Thank you,  
The IMAGING Management Editorial Team*

rate 73%) responded. The results supported the belief that improvements in clinical handover were needed at the hospital. Key figures were:

- 94% identified that different nurses give handover in different ways;
- 82% stated that a standardised way of giving handover was needed;
- 85% believed that improvement was needed in the way nurses communicate with each other;
- 86% agreed that improvement was needed in the way that nurses communicate with specialists, and
- 60% wanted to deliver handover more effectively.

### Implementation

All nursing staff attended one-hour workshops on assertive communication and patient assessment, primarily focused upon early recognition of the deteriorating patient. Workshops were mandatory and staff were paid to attend. Presentations were interactive and covered both theory and the lived experiences of staff, highlighting from their own practice examples of good and poor communications.

Two communication tools developed by the project team became the cornerstones of the project. The first was a handover prompt card which provided a template for standardising shift to shift handover. The prompt card was designed to provide a structured, standardised format for handover by establishing a sequence for information transfer, making it easier for staff to identify if information was omitted.

The bright pink handover prompt cards attached to staff identity badges, ensuring they were always available.

The second tool was a communication template or script, to be followed when nurses contacted specialists by telephone about deteriorating patients who required review. This template used a hybrid of the bullet point communication style favored by doctors and the descriptive narrative preferred by nurses. The format helped nurses to structure their communication to facilitate listen-

ing and comprehension. It prompted staff to assess the patient, gather pertinent information and be prepared for questions the doctor may ask. There is space to record doctor's orders and any follow up required. Once completed, this form becomes part of the medical record.

### Outcomes

#### For staff

The tools were evaluated using action research (four completed cycles) and amended as a result of staff feedback and evaluation. Staff identified the value of the tools for ensuring accurate, consistent handovers and keeping staff on task when delivering handover, especially if they were tired at the end of a long shift.

A post implementation survey of nurses showed that:

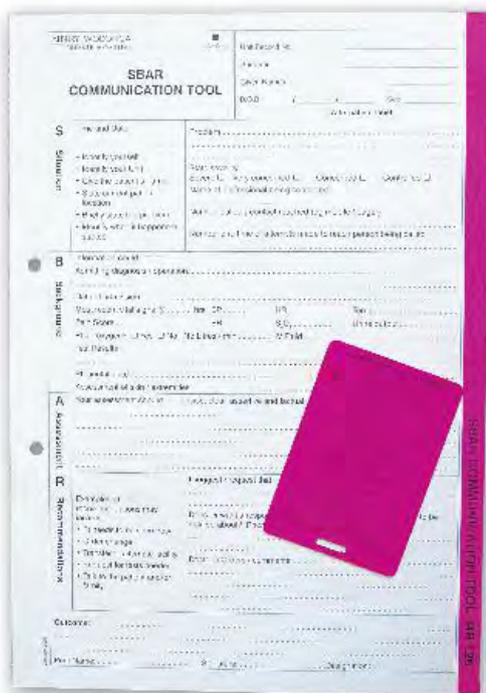
- 68% stated that they now always get the information they need at handover;
- 72% agreed that handover is more structured now than before the project;
- 68% of nurses believed shift to shift handover has improved, and
- 80% felt more confident when communicating with doctors.

In a focus group conducted by the external project team members (EP & EC) PACT champions identified the following benefits:

Handovers more comprehensive and omissions easily identified;

- Increased confidence among junior staff, recent graduates and students;
- Assessment workshops and communication tools led to earlier intervention for deteriorating patients;
- Improved written documentation;
- Less stress for staff in giving handover and when contacting doctors, and
- Nurses now able to identify and act on emerging clinical trends.

Anecdotal evidence supports these findings. Nursing Unit Managers and nurses identified improvements in the quality and structure of handovers given by staff. Handovers were generally more comprehensive and detailed, and structured to include information relevant to each patient. Nurses reported their confidence had increased when giving handover and they strongly supported the use of the template when telephoning doctors about deteriorating patients. Although the template could not remove all anxiety when calling a doctor at 3 am, staff felt more comfortable with a format to follow which kept them focused and prepared.



### For patient safety

There have been a number of patient care benefits from the project. Analysis of the communication templates used by nurses when calling doctors allowed the identification of emerging clinical trends. To date the major reasons for calls include:

- Uncontrolled nausea and vomiting;
- Uncontrolled pain, and
- Observations outside normal limits.

One outcome has been the introduction of an antiemetic protocol. Since its implementation there have been no telephone calls to doctors regarding uncontrolled nausea and vomiting. Staff identify and respond to deteriorating patients much sooner than previously, leading to more timely care and interventions. Collection of statistical data including Medical Emergency Team (MET) calls and transfers to the high dependency unit is continuing, to evaluate the long term impact of the PACT project.

### Conclusions

A key focus for hospital managers today is to ensure optimal treatment, patient safety and early identification of issues that might lead to delays in discharge. Timely discharge and high patient satisfaction are especially important in the private (for profit) sector. The PACT project has shown one way to achieve these outcomes.

Another key issue is recruitment and retention of nurses, with stress cited as a major cause of staff morbidity, absenteeism and departure. The PACT project has shown one way to reduce stress among nurses by increasing their skills and confidence.

Future initiatives for this project include expanding and adapting the tools to the specialty areas of the hospital including Post Anaesthetic Care Unit, Oncology and Mental Health Units. There are also plans to extend the use of the PACT project to other hospitals across Australia.

The ongoing challenge for the project is to maintain staff enthusiasm for and compliance with the structured programme. This can be achieved through embedding it in hospital policy, including it in orientation programmes for new staff and having mandatory annual updates for all staff. ■

### Acknowledgements

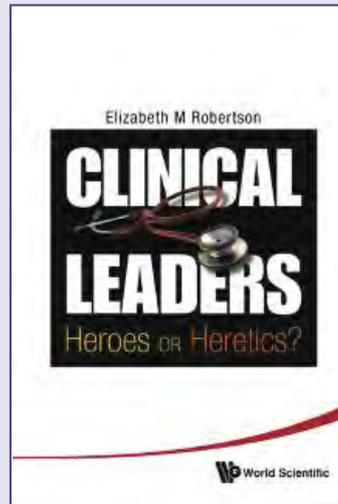
This project was supported by funding from the Australian Commission on Safety and Quality in Health Care.

*A full list of references for this article is available on request to the Managing Editor at [editorial@imagingmanagement.org](mailto:editorial@imagingmanagement.org)*

## BOOKS IN REVIEW

### CLINICAL LEADERS Heroes or Heretics?

by Elizabeth M Robertson  
(NHS Grampian, UK)



Clinical training and background are not synonymous with leadership. So where does a potential clinical leader turn to for advice? This small handy volume is specifically written for this purpose with information about the softer skills of leadership. It is not linked to any particular healthcare system or clinical discipline. Focus on leadership as a means to influence healthcare culture is attracting attention internationally currently. There is a lack of published material aimed at clinical leadership and the time is ripe to channel and develop formal pathways to support this unmet need. There is an appetite for understanding what leadership involves and the book is aimed at that. It provides useful information presented in a highly readable style.

Readers will find the style a refreshing change from the usual academic material. Accounts of hands-on experience with non-pedantic pragmatic advice are reflected strongly in the book. It draws heavily on the concept that perceptions may not be shared. This may be the basis for fruit-

ful communication and mutual understanding, if not necessarily agreement. Clinical leadership is an evolving discipline and seldom do currently practicing individuals have an accredited qualification. They rather build up 'on-the-job' experience. This compendium of real life experiences and educational facts attempts to bridge the gap and prepare healthcare professionals to hit the ground running in their leadership roles.

The book's narrative pace will make it a good holiday or long journey read. The subject matter is neither dry, trivial nor trite.

### Readership:

*Undergraduates in healthcare-related fields. Healthcare professionals who may have to fill clinical leadership roles. Colleges, associations and societies in any branch of medicine, surgery, nursing, allied health professions. Doctors, nurses, pharmacists, physiotherapists, radiographers and many other therapists.*

### Chapters:

- Leaders, Managers and Administrators
- So What is Leadership?
- Leadership Qualities
- The Leadership Role
- Perception
- Team Working
- Team Building
- Team Leader
- Complaints and Feedback
- Difficult Situations or Difficult People? Is It Me?
- Clinical Engagement
- Influencing and Negotiation
- Service Transformation
- Negotiation and WIIFM
- Communication
- Committees
- Followership
- Helping Others to Help You
- And Finally ... Clinical Leaders: Heroes or Heretics?

# PICTURE ARCHIVING AND COMMUNICATION SYSTEMS (PACS)



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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](http://www.ecri.org)

\* These recommendations are the opinions of ECRI Institute's technology experts. ECRI Institute assumes no liability for decisions made based on this data.

MODEL	PACS	Fusion PACS GL
WHERE MARKETED		Europe
CE MARK (MDD)		Yes
SYSTEM CONFIGURATION		
Architecture	Single server cluster	Single Server or Active Load Balanced
Hardware	Hardware-independent	Hardware -independent
Operating systems		
Image server	Windows or UNIX	Windows
Web server	Windows or UNIX	Windows
Security	128-bit SSL	SSL
Database server	Windows or UNIX	Windows
Management	Experienced database company	MS SQL
Long-term storage		
Media	Hardware independent	NAS, SAN, DVD, tape
Hardware	RAID (SAN)	RAID (SAN/NAS)
SERVICE & SUPPORT		
Telephone	24 hr	24/7
On-site response time	24 hr	<24hr
Remote system monitoring/updates	Yes	Yes
DIAGNOSTIC WORKSTATION		
Independent login	Yes	Yes
Admin-contr. worklist/ad-hoc patient search/auto notification/user definable hanging protocols	Yes	Yes
Prior reports (without images)	Yes	Yes
Session interruption function	Yes	No
3-D image processing	Yes	Yes
Integrated report dictation /Voice recognition	Yes	Yes, integrated with Dictaphone PowerScribe
WEB IMAGE ACCESS		
Max number monitors supported	2	2
Patient search	Name or MRN	Several Parameters
SYSTEM ADMIN		
DBase frequency	Every hour	Configurable
Auto duplication of long-term archive	Yes	Optional
Test server	Yes	Optional
INTERFACES		
IHE conformance	Year 5	all relevant profiles
RIS	Brokerless, bidirectional	HL7, ADT/ORM/ORU messaging
Electronic patient record	Yes	Yes, direct access via Web link
PLANNING & PURCHASE		
Price structure	Hardware and software separate, based on number of exams	SW only or with HW, based on # of exams
Training	1 week	On-site or remote
Delivery time, ARO	1 month	usually < 1 month
Year first sold		2004
Number of full system installs		> 80 (Europe only)
LAST UPDATED		May 08

Centricity	Synapse	syngo Dynamics	IMPAX
Worldwide	Worldwide	Worldwide	Worldwide
Yes	Yes	Yes	Yes
Central database with image cache options	Client/server distributed, Web-based	Client/server	Centralized server
Sun, Wintel (Web)	Windows compatible	HP enterprise servers	Dell, IBM, HP, Sun (servers)
Solaris, UNIX, Linux Windows	Windows 2003 Windows 2003, IIS	Windows 2003 server MS IIS (Win 2003)	Windows, UNIX Windows
VPN or SSL UNIX	128-bit SSL Windows 2003	SSL Windows 2003	128-bit SSL Windows, UNIX
Sybase	Oracle	Microsoft SQL	SQL or Oracle
Spinning disk, DVD, UDO, major HSM Direct attached, area network storage	Selectable to customer requirements Any spinning disk technology	Dual-DVD(entry-level), HSM, PACS RAID	Tape, DVD, spinning disk, MOD, UDO, HSM, others RAID (SAN/NAS)
24/7/365 4 hr with agreement, 12 hr noncritical	24 hr Depends on contract	24 hr 24 hr or based on contract	24/7, 1 hr response Depends on agreement
Yes	Yes	Yes	Yes
Yes	Yes	Yes and user	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
Yes	Native thin-client MIP/MPR module available, or context integration to third-party 3-D applications	Yes, through additional software tools	Yes
Yes, third-party client	Third-party integrated	No	Yes
2 Patient name, MRN, exam date, modality	5 Name, MRN, census	1 Name, MRN, user defined	Up to 5 Over 30 search criteria including Name, ID, GPI, location, accession number, doctor, modality, body part, study status, sex, MRN
Site configurable Yes Optional	Daily, configurable Optional Yes	Daily Yes Optional	Configurable Yes Yes
SWF, PIR, ARI	Selected profiles	Yes	All relevant radiology, cardiology, IT Infrastructure Integration profiles
Brokerless, bidirectional Via URL	Brokerless, bidirectional, HL7 Web interface Yes	Bidirectional Broker or interface	Bidirectional using HL7, DICOM, IHE, Custom Image enabler to EMR and EMR on radiology desktop
Concurrent-users license for procedure volume, workstations HQ, on-site, remote 90-120 days 1992 570 May 08	Turnkey, software only, and per-usage options Varies 90 days 1998 400+ (USA), 1,000+ (Worldwide) May 08	Hardware and software separate 2-3 days 90 days 1999 >900 May 08	Turnkey or software-only solutions available Variable Variable 1990 1,700 PACS systems and over 600 integrated RIS/PACS systems May 08

Product Comparison Chart



MODEL	Visage PACS	HORIZON MEDICAL IMAGING
WHERE MARKETED	Worldwide	North America, Europe
CE MARK (MDD)	Yes	Yes
SYSTEM CONFIGURATION		
Architecture	Single server, single or multiserver clusters, Web-based, failover, NET	Multitiered, centralised, or distributed infrastructure serves dedicated, smart, or Web clients
Hardware	HP, Dell, Intel, IBM	HP, IBM, Dell
Operating systems		
Image server	Windows 2003	Windows 2003
Web server	Windows 2003	Windows 2003
Security	SSL	128-bit SSL, VPN
Database server	Windows 2003	Windows 2003
Management	Cache/SQL	Oracle 9i
Long-term storage		
Media	RAID, backup (tape, disk, DVD)	AIT, DVD, MO, Enterprise integration
Hardware	Hard disk RAID (SAN/NAS)	RAID (NAS/SAN), Enterprise integration
SERVICE & SUPPORT		
Telephone	24/7/365	24 hr
On-site response time	Same day, 1 day	4 hr
Remote system monitoring/updates	Yes	Yes
DIAGNOSTIC WORKSTATION		
Independent login	Yes	Yes
Admin-contr. worklist/ad-hoc patient search/auto notification/user definable hanging protocols	Yes	Yes
Prior reports (without images)	Yes	Yes
Session interruption function	Yes	Yes
3-D image processing	Yes	Yes
Integrated report dictation /Voice recognition	Yes	Optional; PowerScribe, Lanier, Dictaphone, Fusion, Win-Scribe, SoftMed, eScription, Vianeta; Speech Q, Talk Technologies, DEWS, RadWhere, Fusion Expert
WEB IMAGE ACCESS		
Max number monitors supported	3+ Name, accession number,	Any configuration supported by operating system and workstation chassis
Patient search	MRN, exam date, institution, DOB, others	Name, MRN, accession number, date range
SYSTEM ADMIN		
DBase frequency	Optional	Daily and hourly incremental
Auto duplication of long-term archive	Optional	Yes
Test server	Optional	Yes
INTERFACES		
IHE conformance	Yes	Years 1-7
RIS	Brokerless, bidirectional	Brokerless, bidirectional
Electronic patient record	URL or direct	Yes
PLANNING & PURCHASE		
Price structure	Hardware, software, licensing	Hardware and software are quoted separately
Training	On-site, shared desktop, CD	Yes
Delivery time, ARO	3 weeks	120 days
Year first sold	2001	1992
Number of full system installs	>1,000	1000+
LAST UPDATED	May 08	May 08

# THE ROLE OF 18F-FDG PET CT IN MONITORING TUMOUR RESPONSE

## Optimal Management of Oncology Patients

Early evaluation of tumour response to chemotherapy is crucial for optimal management of oncology patients, especially given the lack of suitable response evaluation criteria to new molecular-targeted anticancer therapies. 18F-FDG PET-CT offers an added value for assessing aggregate (dimensional and metabolic) tumour response after completion of treatment in various cancer types. This methodology is being currently investigated to follow tumour responsiveness sequentially, after one or more courses of chemotherapy.

In fact, correlation between early changes in 18F-FDG uptake and overall patient survival represents a very meaningful research opportunity. The preliminary results call for systematic inclusion of 18F-FDG PET technology early in the therapeutic algorithm. To properly place 18F-FDG PET in treatment timelines (on both cancer-type-basis and regimen-basis) will change current therapeutic concepts leading to individualise treatment of patients. Patient management might be changed. For instance, in non responder patients this novel diagnostic approach would hamper useless "wait and watch" attitude in implementing further options or identifying those needing additional therapeutic strategies. On the other hand, for those patients revealing promptly a favourable metabolic response a cost-sparing approach could be implemented avoiding expensive diagnostic procedures during the follow-up as well as the risk of over-treating. In any case, since even a partial metabolic response may be an indication for continuing therapy, the advantage of metabolic assessment over conventional procedures may be clinically relevant.

18F-FDG PET has a consolidating role when therapy efficacy is assessed after completion of treatment regimens in terms of both outcome and timing in performing PET scan. In order to attain the highest sensitivity for the detection of residual tumour cells 18F-FDG PET should be performed as late as possible after completion of therapy. However, a deferral of three to six weeks seems to be a realistic compromise.

### European Recommendations

The European Organisation for Research and Treatment of Cancer (EORTC) PET study group has formulated some recommendations in order to properly implement such

methodology (Young 1999). In particular, it has been suggested to execute pre-treatment and post-treatment scans for comparison, to acquire pre-treatment scans as close as possible to the commencement of treatment and to adapt the timing of the post-treatment scans to the chosen endpoint, being it sub-clinical or clinical, and to the chemoreponsiveness of the tumour type.

In some tumours attempts to estimate the capabilities of 18F-FDG PET earlier (few weeks) after completion of treatment have been made, but needs to be confirmed in larger series. The clinical impact of 18F-FDG PET has also been evaluated at midtherapy. Nevertheless, this latter approach seems to be reliable only for some settings and cannot be implemented routinely. On the other hand, there is at the present sufficient evidence (Avril and Weber 2005; Brun et al. 2002; Wahl et al. 1993; Weber et al. 2001; Weber et al. 2003; Wieder et al. 2004) that the early assessment of tumour response to therapy by 18F-FDG PET may play a crucial role in patient management.

Current data endorse to consider one to three weeks after initiation of first chemotherapy cycle the optimal time in performing PET scan if an early tumour response assessment is required (see figure 1, p. 34).

This approach appears to be suitable for many solid tumours and therapeutic regimens, and could be implemented in neo-adjuvant and adjuvant settings as well as during the treatment of metastatic disease. In addition, a similar trend has been reported in studies on lymphomas (Kostakoglu et al. 2002; Spaepen et al. 2001). The early identification of chemotherapy-refractory lymphoma patients provides a basis for alternative therapeutic strategies recognising those who would benefit from more intensive treatment programmes.

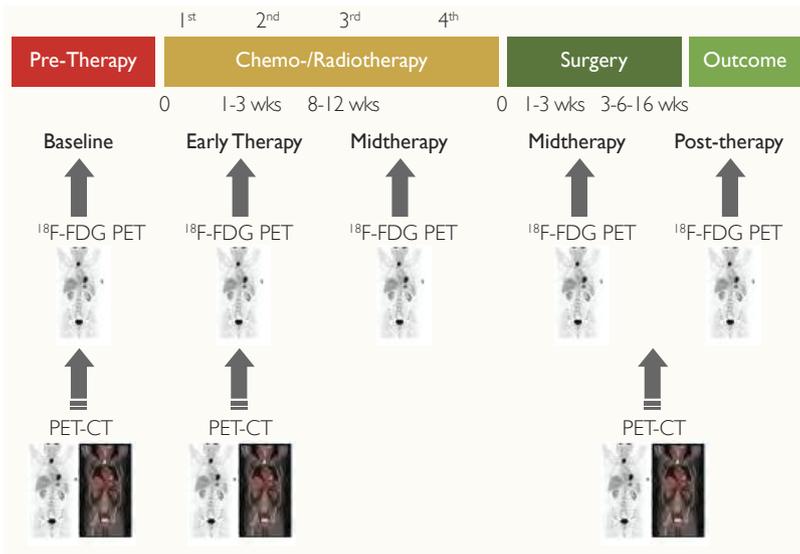
It should be highlighted that the present definition of tumour response is based on the measurement of changes in tumour size as determined with morphological imaging methods (RECIST version 1.0 and 1.1) (Eisenhauer et al. 2009; Therasse et al. 2000). However, morphological imaging have limitations in assessing the therapeutic effect since changes in tumour size ensue the biologic response to therapy, which is considered a trouble in early response monitoring. Accordingly, RECIST criteria have been recently updated revising, for instance, the concepts of target and



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### Early Use Proven to be Superior

In addition, the introduction of molecular-targeted agents such as the angiogenesis inhibitors, requires new alternative end points for monitoring therapeutic effects since they determine biological effects other than cytotoxicity. This context has necessitated new imaging modalities.

The use of 18F-FDG PET early in the course of therapy is supported by two main evidence; the registered high accuracy for predicting tumour response and patient outcome and the capability to assess molecular mechanisms involved in the process.

The uptake threshold settled for identifying response depends on multiple variables such as tumour type, type of therapy and interval after onset of therapy. However, a mean reduction in 18F-FDG standardised uptake value (SUV) with effective chemotherapy has been detected for responding patients across tumour types and chemotherapeutic regimens (Findlay et al. 1996; Haberkorn et al. 1993; Wahl et al. 1993). A decrease of 10-35 percent was seen in the SUVBW (body weighted) value after one cycle of chemotherapy in responders. This threshold increased to 40-50 percent after three cycles or at the end of treatment. Generally, a 35 percent cut-off after

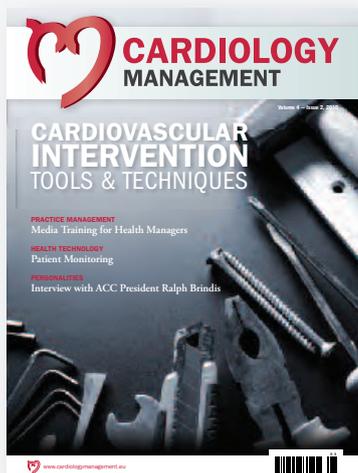
Figure 1.

Timeline for evaluation of tumour response by FDG PET according to clinical relevance in published studies. Including PET-CT. Wks: weeks.

non-target lesion as well as the approach to the assessment of lymph nodes (Eisenhauer et al. 2009) and indicating that it is sometimes reasonable to incorporate the use of FDG-PET scanning (particularly for possible 'new' disease). Later, a draft framework for PET response criteria in solid tumours has been proposed (PERCIST 1.0) (Wahl et al. 2009).



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one cycle of therapy appears to be a reliable predictor of response throughout different cancers leading to sensitivities, for predicting therapy response, higher than 70 percent.

**Closer Molecular Assessment Essential**

In terms of clinical response, a reduction of greater than 25 percent was seen at some time points in the treatment of responding tumours. None of the studies reported a significant reduction in 18F-FDG uptake in non-responding tumours. It should be underlined that 18F-FDG PET, for its intrinsic characteristics, allows a molecular assessment, which is essential to understand the mechanisms sustaining the therapeutic response. For instance, it has been helpful in detecting changes in glucose metabolism, which reflect predominantly the cytotoxic effects and thus the loss of viable cells after effective radiotherapy (RT). In addition, it is able to reveal the acute effects of chemotherapy on cellular metabolism which are attributable to rapid apoptotic cell death rather than to a direct cytotoxic effect (Spaepen et al. 2001).

In spite of this, results from 18F-FDG PET imaging may be associated with high false positive findings due to tissue

damage or with false negative results because of alterations in tracer kinetics, mainly after RT. For instance, radiotherapy may cause an inflammatory response and 18F-FDG uptake associated with activated macrophages and neutrophils may confuse signal interpretation. In addition, during the first hours after the treatment a transient “flare phenomenon” has been described (De Witte et al. 1994). It would be a further confusing factor in studies expressly designed to detect reduction in tumour’s 18F-FDG uptake. Nevertheless, this early “flare phenomenon” may have prognostic significance. Although there is no uncertainty regarding the evidence that radiation-induced inflammation accumulates 18F-FDG, its amount is often significantly lower than in untreated tumours. As a result, it appears that the negative effect of radiation-induced inflammation on correct evaluation of tumour response by 18F-FDG PET might not be so critical.

**Early Evaluation May Generate False Negatives**

Early evaluation at one month after the completion of RT may also generate false-negative results. Immediately after



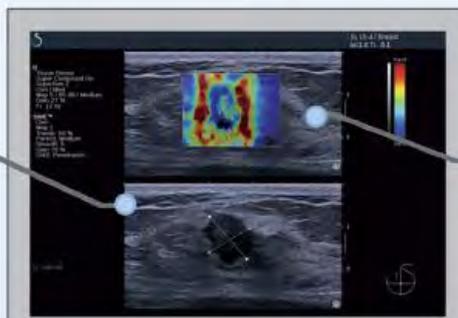
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RT, the incorporation of 18F-FDG into tumour cells may decrease in spite of tumour viability. It was hypothesised that the radiation-induced changes in 18F-FDG uptake might be determined from altered cellular glucose transport mechanisms related to GLUT-1, hexokinase, or vascular damage rather than cell death (Higashi et al. 2000).

Recently, PET-CT technology has showed to convey significant benefit in tumour staging as compared to PET or CT alone. It has enhanced anatomic localisations of anomalies detected by PET alone replacing it in the evaluation of cancer patients. This methodology has not been extensively implemented for assessing tumour response after treatment so far. Although the lack of standardised criteria, its role for the aggregate analysis of metabolic and morphologic changes induced by treatment in cancer is growing.

### Conclusions

18F-FDG PET/CT has already a well-established role in the diagnosis and staging of a wide variety of solid cancers. Preliminary data demonstrate it can also provide early information on tumour response to therapy. In addition, an expanding range of radiotracers is currently being investigated for monitoring response before, during or after therapeutic interventions including radiotracers of DNA synthesis and agents for imaging amino acids, hypoxia and tumour expression of receptors.

As anticancer therapy becomes more individualised, it is increasingly important to identify response to treatment as early as possible. Early identification of responders and non-responders may allow physicians to optimise treatment and to spare costs and morbidity in these patients. ■

# HOW TO CONDUCT STAFF APPRAISALS

## A 12 Point Plan for Success



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A staff appraisal is a periodical advisory and support discussion between staff members and management that fosters agreements about objectives and the achievement of targets, that can be incorporated into target agreements. A staff appraisal provides the opportunity, in a systematic and structured way that is outside of every-day working routine, to discuss matters that support and advance target-oriented cooperation. A staff appraisal is conducted in confidence between the member of staff and the appropriate member of the management team, and is concluded consensually.

Both the staff appraisal and the following target agreement are recorded in a set of minutes. The first of these is confidential. The staff appraisal and target agreement may, if necessary (e.g. at large faculties, when there is a need for agreement for resource planning or an expressed desire), be conducted at two different times. Appraisals should be measurable, so that both you and your staff know when they have succeeded. In the aftermath, do not leave it for a year before discussing things again. You can have short, informal meetings every three months to catch up and identify any issues early. Prior to the formal appraisal, both parties should make preparations. The manager should look at objectives set during previous appraisals, while the employee should give due consideration to any points they want to bring up.

Performance appraisals are crucial for effective management and evaluation of staff. Appraisals help develop individuals, improve organisational performance, and feed into business planning. Formal performance appraisals are generally conducted annually for all staff in the organisation. Each staff member is appraised by his or her line manager. Directors are appraised by the CEO, who is appraised by the chairman or company owners, depending on the size and structure of the organisation.

### Are Performance Appraisals Still Beneficial Today?

There is a tendency in the present day to dismiss traditional processes such as performance appraisals as being irrelevant or unhelpful. Be very wary, however, if considering removing appraisals from your own organisational practices. People have less and less face-to-face time together these days. Performance appraisals offer a way to protect and manage these valuable face-to-face opportunities. There are various ways of conducting performance appraisals, and ideas change over time as to what the most effective appraisals methods and systems are. Some people advocate traditional appraisals and forms; others prefer 360-degree-type appraisals; others suggest using little more than a blank sheet of paper. In fact, performance appraisals of all types are effective if they

are conducted properly, and better still if the appraisal process is clearly explained to and agreed by the people involved. Managers usually need guidance, training and encouragement in how to conduct appraisals properly. Help anxious managers develop and adapt appraisals methods that work for them. There are lots of ways to conduct appraisals, and particularly lots of ways to diffuse apprehension and fear - for managers and appraisees alike. Particularly, encourage people to sit down together and review informally and often - this removes much of the pressure for managers and appraisees at formal appraisal times.

Leaving everything to a single make-or-break discussion once a year is asking for trouble and trepidation. Performance appraisals that are administered without training (for those who need it), without explanation or consultation, and conducted poorly will be counter-productive and are a waste of everyone's time. Well-prepared and well-conducted performance appraisals provide unique opportunities to help appraisees and managers improve and develop, and thereby the organisation for whom they work.

### Creating an Effective Appraisals Process

#### 1. Prepare

Prepare all materials, notes, agreed tasks and records of performance, achievements, incidents, reports etc. - anything pertaining to performance and achievement. Include the previous performance appraisal documents and a current job description. A good appraisal form will provide a natural order for proceedings, so use one. Organise your paperwork to reflect the order of the appraisal and write down the sequence of items to be covered. If the appraisal form includes a self-assessment section and/or feedback section, ensure this is passed to the appraisee in advance with relevant guidance for completion.

#### 2. Inform

Inform the appraisee - ensure the appraisee is informed of a suitable time and place, and clarify purpose and type of ap-

praisal - give the appraisee the chance to assemble data and relevant performance and achievement records and materials. If the appraisal form does not imply a natural order for the discussion then provide an agenda of items to be covered.

#### 3. Venue

Ensure that a suitable venue is planned and available, private and free from interruptions. Observe the same rules as with recruitment interviewing - avoid hotel lobbies, public lounges, canteens. Privacy is absolutely essential.

#### 4. Layout

Room layout and seating are important elements to prepare. Layout has a huge influence on atmosphere and mood. Irrespective of content, the atmosphere and mood must be relaxed and informal. Remove barriers - don't sit in the boss's chair with the other person positioned humbly on the other side of the desk; you must create a relaxed situation, preferably at a meeting table or in easy chairs. Sit at an angle to each other, 90 degrees ideally - avoid face to face, it's confrontational.

#### 6. Opening the appraisal

It is important to relax the appraisee. Open with a positive statement, smile, be warm and friendly - the appraisee may well be terrified; it's your responsibility to create a calm and non-threatening atmosphere. Set the scene. Simply explain what will happen. Encourage a discussion and as much input as possible from the appraisee - tell them it's their meeting not yours. Confirm the timings, especially finishing time. If helpful and appropriate begin with some general discussion about how things have been going, but avoid getting into specifics, which are covered next. Ask if there are any additional points to cover and note them down so as to include them when appropriate.

#### 7. Review and measure

Review the activities, tasks, objectives and achievements one by one, keeping to distinct separate items one by one - avoid

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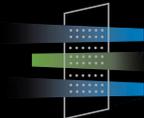
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teria (box). Such criteria allows for a cross-departmental understanding of each solution.

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## HOW IT WORKS

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audience, and our panel of judges will place their votes. The top nine presentations make it through to the second day of competition where they are given the opportunity to present their projects in detail. This Workbench presentation has an allocated time of 30 minutes followed by 15 minutes of cross-examination.

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days of informative presentations of fully implemented and running IT and medical technology projects. Moreover, you will have a say in who will win the trophy. Refreshments, lunch and evening entertainment are also included, giving ample opportunity for networking.

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going off on tangents or vague unspecific views. Concentrate on hard facts and figures, solid evidence - avoid conjecture, anecdotal or non-specific opinions, especially about the appraisee. Being objective is one of the greatest challenges for the appraiser - as with interviewing, resist judging the appraisee in your own image, according to your own style and approach - facts and figures are the acid test and provide a good neutral basis for the discussion, free of bias and personal views. For each item agree a measure of competence or achievement as relevant, and according to whatever measure or scoring system is built into the appraisal system.

#### 8. Agree an action plan

An overall action plan should be agreed on with the appraisee that takes account of the job responsibilities, the appraisee's career aspirations, the department and organisation's priorities, and the reviewed strengths and weaknesses. The plan can be staged if necessary with short, medium and long-term aspects, but importantly it must be agreed and realistic.

#### 9. Agree necessary support

This is the support required for the appraisee to achieve the objectives, and can include training of various sorts. Be careful to avoid committing to training expenditure before suitable approval, permission or availability has been confirmed

- if necessary discuss likely training requirements with the relevant authority before the appraisal.

#### 10. Invite any other points or questions

Make sure you capture any other concerns.

#### 11. Close positively

Thank the appraisee for their contribution to the meeting and their effort through the year, and commit to helping in any way you can. Produce a meeting note or completed summary. Provide two copies of the meeting note or completed summary and ask the appraisee to sign and return one copy to you if they are in agreement that it accurately reflects what was discussed and agreed.

#### 12. Record main points, agreed actions and follow-up

Swiftly follow up the meeting with all necessary copies and confirmations, and ensure documents are filed and copied to relevant departments, (HR, and your own line manager typically). Make yourself available to discuss concerns that the appraisee might have about the meeting note. It could be that you have misinterpreted something or incorrectly recorded it.

### 360-Degree Feedback

360 degree appraisals are a powerful developmental method and quite different to traditional manager-subordinate appraisals (which fulfill different purposes). As such, a 360 degree process does not replace the traditional one-to-one process - it augments it, and can be used as a stand-alone development method. 360 degree appraisals involve the appraisee receiving feedback from people (named or anonymous) whose views are considered helpful and relevant. 360 degree respondents can be the appraisee's peers, up-line managers/execs, subordinate staff, team members, other staff, customers, suppliers - anyone who comes into contact with the appraisee and has opinions/views/reactions of and to the appraisee. Numerous systems and providers are available. The feedback is typically provided on a form showing job skills/abilities/attitudinal/behavioural criteria and some sort of scoring or value judgement system. The appraisee should also assess themselves using the same feedback instrument or form. ■

#### Further Reading:

1. Performance Appraisal: Pocket Mentor. McGraw-Hill Professional 2009
2. Conducting Staff Appraisals: How to Set Up a Review System That Really Will Improve Individual Performance and Organisational Results (Paperback). How To Books Ltd; 6Rev Ed edition 2007
3. [www.businessballs.com](http://www.businessballs.com)

### Purpose of Performance Appraisals

- Enable management and monitoring of standards, agreeing expectations and objectives, and delegation of responsibilities and tasks;
- Establish individual training needs and enable organisational training needs analysis and planning;
- Typically feed into organisational annual pay and grading reviews, which commonly coincides with business planning for the next trading year;
- Generally review each individual's performance against objectives and standards for the trading year, agreed at the previous appraisal meeting;
- Are also essential for career and succession planning - for individuals, crucial jobs, and for the organisation as a whole;
- Provide a formal, recorded, regular review of an individual's performance, and a plan for future development;
- Are important for staff motivation, attitude and behaviour development, communicating and aligning individual and organisational aims, and fostering positive relationships between management and staff, and
- Are therefore vital for managing the performance of people and organisations.

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# THE NETHERLANDS

## Overview of the Healthcare System

Author  
Lee Campbell

Senior Editor

According to the annual Euro Health Consumer Index, the Netherlands has the best healthcare system in Europe. It topped the European survey for the second year running scoring highly in waiting times for patients, e-health and access to medication. Many also believe that system in the Netherlands is a good model for healthcare in the U.S. This article provides a brief overview of the system supposedly the best in Europe.

Like most healthcare systems in Europe, the Dutch Healthcare System can be described as a system in transition. The most significant reform is undoubtedly the new healthcare cost system implemented on 1st January 2006. Before 2006, the system was outdated with major flaws:

- Too many schemes- social insurance, private insurance and civil servants;
- No choice;
- Few competition incentives for insurers;
- Little pressure on suppliers to achieve better performance, and
- Unfair premium and income effects.

Key elements of new Act include:

- New standard of insurance for all;
- Citizens can change insurer every year;
- Insurers compete for the business of the insured;
- Customers and insurers stimulate suppliers to provide better quality, and
- Compensation for people on low incomes.

Healthcare insurers must offer health insurance to every-

one, irrespective of personal characteristics and social situation. Everyone is subject to the same conditions and insurers must offer their basic package to all regardless of risks and “expensive customers”. Moreover, insurers have a strong position regarding care providers; they negotiate with care providers on price, content and organisation of care.

For care providers the reform act is about delivering better performance. Previously it was the care providers who had the dominant position- they determined what care was provided and its quality. There was little incentive to improve and measure performance. This has changed with insurers pushing for higher standards (quality and cost). There are now performance-oriented costing systems and benchmarking initiatives. These measurements offer care providers opportunities to distinguish their hospitals/facilities from those around them and also customise their services.

The short term results of the reform act are a single legal framework, more choices for customers, more competition and guaranteed affordability. In the long term it is hoped these changes will provide a better quality of care, greater cost-consciousness and a tailor-made care through the greater influence by customers.

### The Organisation of Care

Public health services, primary care and secondary care are three separate entities in the Netherlands, each playing a distinct role. Public health services are provided through local offices all over the country. Primary care is provided by family physicians and secondary and tertiary care in hospitals.

### Public Health

There is a regional network of public health services. Municipal services include child health examination, vaccinations, environmental health, health protection and promotion. Local services include infectious disease control, general hygiene, school health and health education.

### Primary Healthcare

This is provided mostly by family physicians- the family physician is the gatekeeper of the primary healthcare system. Patients need referral for hospital and specialised treatments.

Table 1.

Key Health Indicators for  
The Netherlands  
(Source: World Health  
Statistics 2008)

		DATE
Population (million)	16.38	2006
Life expectancy at birth (years)	78 (male) and 82 (female)	2006
Healthy life expectancy at birth (years)	70 (male) and 73 (female)	2003
Probability of dying under 5 (per 1,000 live births)	5	2006
Probability of dying between 15 and 60 years (per 1000 population)	81 (male) and 59 (female)	2006
Gross national income per capita (PPP International USD)	37,940	2006
Total healthcare expenditure per capita (PPP USD)	3,383	2006
Total healthcare expenditure (% GDP)	9.3%	2006
Number of physicians	60,519	2005
Number of nursing and midwifery personnel	239,172	2006
Physician density (per 10,000 inhabitants)	37.0	2005
Nurses and midwife (per 10,000 inhabitants)	146.0	2006

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Evidence of the success of this “gatekeeper” system lies in low referral rates. Low prescription rates are also noted.

#### Secondary and Tertiary Care

Secondary care is provided by medical specialists in hospitals. Specialists who provide both inpatient and outpatient are not employed by the hospitals but are self-employed working on a contractual basis. There is a strict referral policy, patients can

only go directly to the hospital in an emergency situation.

#### Transmural care

This is a term used to refer to care given across the walls of the system. Transmural care also plays an important role by bridging the gap between outpatient and inpatient care. This includes the use of home care technology, specialised nurses and guidelines. It is particularly useful for chronic patients. ■

# E-HEALTH IN THE NETHERLANDS

## A Model for Connectivity

#### Source

National IT Institute for  
Healthcare (NICTIZ)

The Netherlands

The primary aim of the Dutch government’s IT policy for the healthcare sector is to improve affordability, access and quality by setting a foundation for an optimum and safe usage of ICT. The introduction of the Electronic Health Record (EHR) with corresponding infrastructure was founded as a springboard for other ICT applications in, including teleradiology and telemedicine.

An IT & Innovation Steering Group, consisting of a selection of representatives of the umbrella organisations (Ministry of Health, Welfare and Sport, NICTIZ, healthcare providers, patients and insurers) meets once every six weeks under ministerial leadership to take decisions on and monitor the progress of these IT and innovation projects. The Ministry of Health, Welfare and Sport has been working in cooperation with the National IT Institute for Healthcare (NICTIZ) and the Central Information Point for Healthcare Professions (CIBG) on the development of a nationwide system for the electronic exchange of medical data. However, the promotion of ICT in healthcare does not stop at the geographical borders of the Netherlands.

Many initiatives have also been launched in the international domain, aimed at improving the affordability, accessibility and quality of healthcare through the deployment of ICT (e.g. Large Scale Projects, SNOMED, Sustainable Telemedicine). Another trend is increasing mobility among patients and professionals. Further objectives are being pursued at political level to give shape and form to trans-border mobility and preventive medicine.

#### National Identification Numbers Key

To ensure that data is registered consistently and that patients, healthcare providers and insurers communicating

at a distance are properly identified, unique national identification numbers are applied, namely:

1. The Citizen Service Number (BSN) for patient identification. The introduction of this number into all government organisations will be regulated by law. Separate legislation will be drawn up for the use of this number in the care sector.
2. A Unique Healthcare Professional Identification (UZI) exists for the identification and authorisation of relevant care providers. A register of care providers has been set up, which also sees to the issuing of UZI passes and UZI certificates for identifying and authenticating care providers.
3. Unique Health Insurer Identification (ZOVAR) exists for the identification of health insurers. A register of health insurers is set up and certificates issued to confirm identities when data is exchanged electronically. The EHR is connected to the national infrastructure, called AORTA.

AORTA is the Dutch national infrastructure for the exchange of data between healthcare providers. The infrastructure specifications include a description of technical, organisational as well as implementation aspects. The focus of this programme is to facilitate the realisation of a national “continuity of care” oriented EPR. AORTA uses HL7 version 3 messages and documents as its core mechanism for information exchange. Data from different healthcare information systems are linked in the EHR. The digital exchange between healthcare providers takes place via the AORTA model, an architecture consisting of different components, including the Citizen Service Number (BSN), the Unique Healthcare Provider Identification (UZI), the Na-

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tional Switch Point (LSP) and the information systems used by the healthcare providers, as discussed here.

### Role of the National Switch Point

On 31 January 2006 the National Switch Point (LSP) for the healthcare sector was established. This was an important step, as the National Switch Point is the 'traffic control tower' behind the secure electronic exchange of up-to-date patient data throughout the Netherlands. With the National Switch Point as the heart of national operations on this level, healthcare professionals across the country can retrieve up-to-date patient information from the systems of hospitals, pharmacies and GPs.

### Primary Advantage

The primary advantage of the National Switch Point is that care institutions and suppliers of ICT applications for the healthcare sector have one point of contact for specific services:

- The National Switch Point manages a 'national refer-

ence index', which can swiftly track patient data when a healthcare provider requests specific information. The patient data are not stored at a central point. The reference index keeps track of which patient data are stored in which information system in the country.

- At the same time, the National Switch Point confirms that information is supplied only to healthcare providers with the requisite authorisation. The switch point checks the provider against the national UZI register. The provider must prove his identity with an UZI pass.
- The National Switch Point also confirms with the aid of the Citizen Service Number that the correct patient data are being supplied. The government is responsible for issuing and controlling this national patient identification number.
- Finally, the National Switch Point ascertains which information the healthcare provider may access (authorisation) and keeps a record of the provider and the consulted data (logging), so that the authorisation regulations can be monitored. ■

# SUSTAINING THE FUTURE OF NUCLEAR MEDICINE

## The Netherlands Leads the Way

Reporter

Dervla Gleeson  
Managing Editor

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The Netherlands continues to be at the centre of debate regarding the continued supply of medical isotopes worldwide. Molybdenum-99, the parent generator of technetium-99m, is a crucial tool used by nuclear medicine departments to pinpoint cancer. The substance is regularly in short supply because only five large commercial producers exist worldwide, mainly via older reactors nearing the end of their lifecycle. The High Flux Reactor (HFR) in Petten, the Netherlands, a property of the Joint Research Centre (JRC) of the European Union, is Europe's largest supplier and was therefore one of the key catalysts for concern for supply of this agent. In August 2008, a jet of gas bubbles was discovered in the primary cooling water system in the Petten HFR during a standard inspection and the Nuclear Research and Consultancy Group (NRG), operator of the HFR and nuclear expert body in The Netherlands took the reactor out of service on 19 February so that localised re-

pairs could be made. This reactor is only recently back in operation, following completion of repairs but is nevertheless planned to finish its lifecycle in 2015.

NRG states that the facility currently supplies around 60 percent of European and 30 percent of global demand for medical isotopes and over 24,000 patients are treated with isotopes produced in Petten every day. Also, one of its neutron beam channels, originally installed for performing research, was modified for the direct irradiation of patients. When the facility broke down earlier this year, it prompted a crisis as it, and several other worldwide reactors reach the end of their lifecycle. Stakeholders realise that now, more than ever, alternate strategies will need to be developed in the likely reoccurrence of such a crisis to ensure that patients can continue to benefit from nuclear medicine.

Said Rob Stol, General Director of NRG "We are very much aware of our great social responsibility. As you can

## » BACKGROUND TO THE CRISIS

Tens of millions of nuclear medicine procedures are performed each year, and demand for radioisotopes is increasing rapidly. Over 10,000 hospitals worldwide use radioisotopes in medicine, and about 90% of the procedures are for diagnosis. The most common radioisotope used in diagnosis is technetium-99, with some 30 million procedures per year, accounting for 80% of all nuclear medicine procedures worldwide. European Association of Nuclear Medicine (EANM) President Wolfram Knapp states that "More than 90 per cent of all molybdenum-99 is produced in only five reactors throughout the world, namely in Chalk River (Canada), Petten (the Netherlands), Mol (Belgium), Saclay (France) and Pelindaba (South Africa). A prolonged reactor shutdown in Chalk River led to supply shortages in North America in 2007. In summer 2008 a shortage also occurred in Europe because all three European reactors were out of operation simultaneously.

Since May 2009 the reactor in Chalk River has been on an extended shutdown for repair. Over the next five to ten years there is a risk of a chronic undersupply because it is feared further interruptions in production may occur since all of the main reactors are over 40 years old". Ways of dealing with the crisis have been sought during this year in urgent discussions with various bodies including the Association of Imaging Producers & Equipment Suppliers (AIPES), the EU Health Security Committee (HSC) and the Nuclear Energy Agency of the OECD.

Imagine, we are delighted that the reactor is back in action so that we can resume our work. The first isotopes are being produced right now and our research into materials and fuels for nuclear power stations and recycling of nuclear waste is up and running again."

### New Reactor Planned to Replace HFR

NRG is currently raising funds and seeking tenders for the construction of a new reactor in The Netherlands to replace the HFR, which will inevitably wind down. First generation research reactors in the EU are approaching operational retirement, as maintenance costs increase and materials and components age. NRG therefore plans to build a new research reactor called PALLAS which is estimated to cost up to a total of 500 million euros. This will be a state-of-the-art reactor equipped to meet the growing world demand for both nuclear knowledge and services and the production of essential medical isotopes. It will have the capacity to be the world's biggest producer of such isotopes.

The tender process for PALLAS began in 2007 and will continue through 2010 - 2011. The licensing process be-

gan in Autumn 2009 with a "Notification of Intent to conduct an Environmental Impact Assessment" (EIA) for PALLAS. Public hearings have been held to inform the national EIA committee's approach to consideration of the Impact Assessment. This summer past, NRG received the 'Richtlijnen Milieueffectrapport', the final guidelines for the Environmental Impact Assessment. The PALLAS project team in Petten will guide design and construction processes, is responsible for the licensing and commissioning and will manage the design and construction of the reactor infrastructure. Depending on the success of fundraising, the facility could be constructed in 2014 or 2015 and become operational in 2016.

### Alternate Strategies

Meanwhile the Technical University (TU) of Delft's nuclear research reactor will be used as a back-up facility for the production of the radioactive isotope molybdenum-99, when supplies run out. TU Delft's research reactor is used for scientific research in the fields of health, energy and materials. The Oyster Programme (which stands for 'Optimised Yield - for Science, Technology & Education - of Radiation') will enable the reactor to meet new scientific challenges and respond to societal issues. The production for molybdenum-99 is one example of this. The programme will enable the production of molybdenum to be increased as it will make more neutrons available.

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**"Meanwhile the Technical University (TU) of Delft's nuclear research reactor will be used as a back-up facility for the production of the radioactive isotope molybdenum-99, when supplies run out."**

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TU Delft had announced earlier this year that its reactor could act as back-up facility when supplies run out. The Ministry of Health, Welfare and Sport has officially accepted this offer and asked the university to adapt its reactor for the production of this isotope. The Delft research reactor will now be adapted so that it can start to produce molybdenum-99. As soon as safety standards have been met and approved, the reactor will be able to produce molybdenum when required. 'The Reactor Institute Delft wishes to improve the care for cancer patients by helping to ensure that there are sufficient supplies of isotopes for medical use,' says Prof. Tim van der Hagen, director of the Reactor Institute Delft. ■

## KEY CONFERENCES & EVENTS

### NOVEMBER

28 – 03 **RSNA Annual Scientific Meeting**  
Chicago, U.S.  
[www.rsna.org](http://www.rsna.org)

### DECEMBER

10 – 12 **'Diving Into Cardiac Imaging' Congress**  
Grand Cayman, Cayman Islands  
[www.uphs.upenn.edu](http://www.uphs.upenn.edu)

### JANUARY 2011

06 – 08 **4th Leuven Course on Head & Neck Imaging**  
Leuven, Belgium  
[www.headandneckimaging.be](http://www.headandneckimaging.be)

13 – 15 **14th International MRI Symposium**  
Garmisch-Partenkirchen, Germany  
[www.mr2011.org](http://www.mr2011.org)

19 – 20 **IT@Networking Awards 2011**  
Brussels, Belgium  
[www.itandnetworking.org](http://www.itandnetworking.org)

20 – 22 **Management in Radiology – Winter Course**  
Bad Wiessee, Germany  
[www.mir-online.org](http://www.mir-online.org)

### FEBRUARY 2011

17 – 20 **Breast MRI Course**  
Arizona, U.S.  
[www.proscaneducation.com](http://www.proscaneducation.com)

24 – 26 **ECCO 6th Annual Congress: Inflammatory Bowel Disease**  
Dublin, Ireland  
[www.ecco11.ecco-ibd.ie](http://www.ecco11.ecco-ibd.ie)

25 – 27 **7th European Congress on Haematologic Malignancies**  
Budapest, Hungary  
[www.imedex.com](http://www.imedex.com)

### MARCH 2011

03 – 07 **ECR 2011 – European Congress of Radiology**  
Vienna, Austria  
[www.myesr.org](http://www.myesr.org)

26 – 31 **SIR's 36th Annual Scientific Meeting**  
Chicago, US  
[www.sirmeeting.org](http://www.sirmeeting.org)

30 – 03 **International Liver Congress™**  
Berlin, Germany  
[www.kenes.com/liver-congress](http://www.kenes.com/liver-congress)

### APRIL 2011

03 – 08 **43rd International Diagnostic Course Davos**  
Davos, Switzerland  
[www.idkd.org](http://www.idkd.org)

27 – 30 **GEST 2011 Europe – Global Embolization Symposium & Technologies**  
Paris, France  
[www.gest2011.eu](http://www.gest2011.eu)

28 – 05 **74th Annual Scientific Meeting: Canadian Association of Radiologists**  
Montreal, Canada  
[www.car.ca](http://www.car.ca)

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