



COVER STORY

# PATIENT POWER

"Nothing about me without me"

Valerie Billingham

PATIENT EMPOWERMENT, PATIENT PORTALS, POWER  
TO THE PEOPLE, ADPKD REALISING PROGRESS,  
WALKING GALLERY, PATIENT-CENTRED CARE

## MANAGEMENT MATRIX

Health and Climate Change  
Perception Versus Reality in  
the Era of the ACA  
Aerodynamic Leadership  
Challenges of Integration  
Quality and Safety in  
Radiology

Implementing Dose  
Monitoring Software  
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Road?  
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25 X 25: Reducing  
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from CVD

## TECHNOLOGY UPDATE

Portable Ultrasound

## COMPASS

Benelux: Focus on  
Euthanasia

## DATEBOOK

MIR, EUROSON





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# PATIENT POWER



We hear often about patient-centred care and patient involvement, but how aware are you really of the experiences and needs of the patients you serve? Do you know their views of health services and systems they navigate, beyond your experiences of individual interactions or information reported in patient 'satisfaction' surveys? To what extent do patients in your hospitals and communities understand and take part in discussions about improving healthcare for everyone, against a backdrop of rising costs, restricted budgets, innovative (yet expensive) medicines and diagnostics, and rising demand?

At the International Alliance of Patients' Organizations (IAPO) we seek to answer these questions and to identify effective examples and models for improvement, and support improvement locally, nationally and globally. Our vision is a world where patients are at the very heart of health, from global policy-making to decisions made locally and within healthcare teams. Our member patient groups are all patient led, and can be small grassroots organisations led by volunteers, national level disease-specific bodies, or associations crossing regions and continents. Presently we have 250 members covering around 65 different disease areas and countries. We fundamentally believe that communication and collaboration are at the core of the challenges to meaningful patient involvement, and that this is also where solutions will be found.

We aim to be a voice for patients at the global level, advocating and collaborating on World Health Organization (WHO) projects and on pan-European projects. For example, this year we are working with academics, physicians and medical student representatives as part of a WHO project to deliver an

online training resource for health professionals about the social determinants of health. At the European level we are working with health professionals, researchers, regulators, pharmaceutical companies and payers to test different ways to bring new and better medicines to professionals and patients faster.

At the individual level, informed and empowered patients are able to make choices about their treatment options, and many patients can and do take responsibility for their health and management of conditions. With all countries facing ever-increasing demand for services and rising costs for chronic condition management, new technologies offer patients more options to self-manage and to truly have a partnership with their healthcare team. However, this can only work effectively within systems that support patients' right to be involved. Trust and open dialogue is needed, alongside access to advice and support about medicines, treatment and how to recognise and respond to any problems. Online 'apps' already empower many patients to manage their own conditions and are a good example of how new technology can assist the healthcare team and patients by offering the potential for sharing data, improving communication and shared decision-making, as well as the opportunity to tell industry what patients and professionals really need to help improve condition management.

Patients and patient groups are increasingly involved in hospital boards and committees, staff training and open days, or patient advocacy groups. In some hospitals and jurisdictions patients are involved in the review of and decisions about new medicines. Members have been involved with reviewing research proposals and

patient information leaflets, and in specific disease areas patients have completed surveys on weighing up the benefits and risks of different treatment options. However, meaningful patient involvement remains inconsistent, and often no feedback is provided about what difference their input has made. There are clues about where further gains can be made. For example, a patient representative told us that if she was involved in the earliest stages of forming research questions, she would highlight a group of women who are not having their needs met by research or clinical practice. And we have heard examples where clinicians are wary about benefit/risk preference elicitation surveys, because the survey presents treatment options to patients that may not been discussed.

Patient representatives can also add value to improvement initiatives in healthcare services, because they are often closest to a patient and their whole experience. When mapping the patient journey and showing it to clinicians, patient representatives can shock health professionals with the complex, time-consuming and overlapping interventions and pathways. Health professionals often only see the part of the patient experience that overlaps with their own focus.

Health is a human right and patients are the ones who bear the impact of many decisions made without them. Better services can be designed and outcomes delivered by communicating more openly and effectively, listening to and involving patients at all levels, and feeding back to patients on changes, improvements and ongoing challenges. We appreciate the journal's willingness to promote discussion and encourage you to seek further information on IAPO and our partners, guidance, toolkits and activities at [iapo.org.uk](http://iapo.org.uk). ■



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# MANAGEMENT IN RADIOLOGY 2015



William Thorwarth  
Role of speciality  
societies



David Koff  
Workshop on essentials  
in leadership



Stephen Baker  
From the golden age to  
the dark age?



Geraldine McGinty  
Patient-centred  
radiological care

The opportunity to mingle with renowned radiologists from Europe, North America and beyond whilst discussing and learning about management and leadership comes just once a year. The 2015 Management in Radiology Annual Scientific Meeting takes place in the elegant surroundings of Fairmont Rey Juan Carlos Hotel in the heart of Barcelona from 8-9 October.

## Programme

### Thursday 8 October 2015

#### 09:00 Welcome and Introduction

- Prof. Bernd Hamm, European Society of Radiology 2nd Vice-President
- Prof. Peter Mildenerger, Chairman, Management in Radiology Subcommittee of the European Society of Radiology Quality, Safety and Standards Committee

#### 09:15 Multiprofessional Organisation of Radiology Departments

- Jim Reekers, The Netherlands - Management challenges of complex radiology departments: Bottlenecks and solutions

#### 09:30 Roles and Responsibilities in a Radiology Department: Visions Towards an Integrative Approach

- Jane Adam, UK - The radiologist's perspective
- Jim Reekers, The Netherlands - The interventionalist's perspective
- Håkon Hjemly, Norway - The radiographer's perspective
- Carmel J. Caruana, Malta - The medical physicist's perspective
- Rhidian Bramley, UK - The information scientist's perspective
- Teamwork Panel Discussion: a Tool for a Sustainable Future of Medical Imaging Professions

#### 11:30 Auditing and Peer Review

- Peter Mildenerger - Accreditation and clinical audit: A new paradigm for European medical imaging: An introduction
- Jan Schillebeeckx, Belgium - Practical experience and results of clinical audits in radiology departments of European University Hospitals
- Peter Cavanagh, UK - Auditing and peer review: Maximising quality, decreasing errors
- Graciano Paulo, Portugal - A model for harmonisation of radiology practice in Europe
- Tarek Laswad, Switzerland - Peer review to improve radiology reporting quality: experience in a private setting
- Panel Discussion: The pros and cons of auditing and peer review

#### 14:00-16:50 Workshops on Professional Issues

Three workshops are available, starting at 14:00, 15:00 or 16:00 to enable delegates to participate in all three.

- Workshop 1: Workflow, control tools and clinical audit (Christoph Wald, USA)
- Workshop 2: How to bring structured reporting into real life (Robert Oberle, USA & Peter Mildenerger)
- Workshop 3: Essentials in leadership – David Koff, Canada

### Friday 9 October 2015

#### 09:00 Actual Topics in Radiology

- Orpheus Kolokythas, Switzerland - Standardised Online Competency Review and Advancement of Trainee Evaluation System (SOCRATES)
- Salvador Pedraza, Spain - Computer educational game for integrated learning of radiology in management of breast and lumbar diseases
- Geraldine McGinty, USA - A culture of high value patient-centred radiological care
- William Thorwarth, USA - Role of specialty societies in fostering radiologist leadership in high value care
- Jurgen Jacobs - Practical and relevant solutions to simplify the preparation for a clinical audit in radiology

#### 11:30 Responsibilities and Rights During Training

- Jose Luis del Cura, Spain - Staff radiologist's point of view
- Marijana Basta Nikolic, Serbia - Resident's point of view

#### 12:15 Mentoring in a Radiology Department

- Laura Oleaga, Spain - Expert's point of view
- Costin Minoiu, Romania - Resident's point of view
- Utku Şenol, Turkey - 360° Evaluation

#### 13:30 Radiology 4.0 – New Opportunities or Disappearance in the Future?

- Stephen Baker, USA - From the golden age to the dark age? How algorithms and other innovations are clouding radiology's future
- Bibb Allen, USA - Global implementation of mechanisms for justification of medical imaging
- James Brink, USA - Radiologists' role in population health management
- Costin Minoiu, Marijana Basta Nikolic - Radiology 2030 - resident's perspective ■

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# THE FUTURE OF IMAGE GUIDED THERAPY

The possibilities for the future of minimally invasive procedures through image guided therapy are practically endless. At the moment, we perceive image guided therapy as an enabling diagnostic technology for minimally invasive therapy. But its capabilities won't end there; there will be smarter therapeutic devices that not only guide treatment through vascular imaging but also deliver the disease therapy – a truly integrated solution in one device.

I envision a time when all surgical procedures in cardiology, neurology, oncology and even areas like spinal surgery and orthopaedics will be done through minimally invasive treatment, supported by intelligent imaging systems and devices.

## Where are we now?

In the short term, an area showing promising advances is the treatment of hypertension through renal denervation. As you know, hypertension – often referred to as the 'silent killer' – is a leading cause of heart disease and stroke. Renal denervation is a novel therapy approved for uncontrolled hypertension. During this minimally invasive procedure, a catheter emits a radio frequency (RF) energy at the intimal wall of the renal artery to ablate the renal nerve that regulates blood pressure. This shows the potential of image guided therapy to provide a solution for the large group of hypertensive patients that do not respond to drug therapy. While renal denervation is still in its infancy, the promise is out there.

Developments like this will create further demand for us to create tailored technologies and devices that improve patient outcomes, reducing the burden on the healthcare system.

## How can we embrace and deliver the future of image guided therapy?

It is important that we create an environment that enables the adoption of these new clinical procedures so we can deliver on this promising future.

Firstly, we need to develop new technologies and smarter devices that give physicians access to all the relevant information at the point of care. This information then needs to be delivered as seamlessly as possible to help decide the best treatment strategy for each patient. We also need to provide the tools to efficiently guide that treatment and then confirm whether the treatment has been optimally performed.



**Bert van Meurs**

Senior Vice President  
General Manager Image Guided Therapy  
Chairman Philips Medical Systems  
Netherland BV - PHILIPS

## New Collaboration

But technology alone is not enough; firstly for the best outcomes, industry needs to partner with healthcare providers to ensure we are developing solutions that benefit patients. We also need to offer a team of people with the right capabilities and expertise to create optimal workflow environments.

Secondly, we need to ensure new technologies and devices are reconstructed and co-registered with any imaging modality in real time, relieving the need for continuous fluoroscopy and therefore allowing a really strong x-ray dose reduction.

Lastly, as healthcare systems shift to models that focus even more on quality of care, long-term outcomes and outcomes-based payment models, the imperative for providing robust clinical evidence of the health and economic benefits of new technologies is increasing. This clinical evidence will drive guideline change and define appropriate use criteria, which in turn will aid reimbursement across different healthcare systems and ensure the widespread adoption of technological breakthroughs.

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Over time, image guided therapy procedures will ultimately become even more efficient through more intelligent imaging and will lead to lower x-ray dosage. Ranging from peripheral to structural heart disease, as well as neurology and oncology domains, there is a broad spectrum of new procedures that will be made more efficient by image guided therapy. My question to you is this: what do you think the future holds and what needs to be done to achieve it?

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# EUROSON 2015 – 6-8 NOVEMBER, ATHENS

## UNITING MEDICAL SPECIALITIES WITH ULTRASOUND



**Nikolas  
Papantoniou**

Professor of Obstetrics  
& Gynaecology  
University of Athens  
Greece

President  
Hellenic Society of  
Ultrasound in Medicine  
and Biology (HSUMB)

Chairman, Euroson 2015  
Organising Committee

The EUROSON 2015 congress is organised by the Hellenic Society of Ultrasound in Medicine and Biology (HSUMB) and the European Federation of Societies of Ultrasound of Medicine and Biology (EFSUMB). The delegates are the presidents of each national society and the president of EFSUMB.

The scope of the congress is to unite all medical specialties by linking them with ultrasound. Ultrasound is a modality that can be used by physicians of all specialties. The scientific programme is organised around 10 areas:

- Obstetrics & Gynaecology
- Breast
- Musculoskeletal
- Cardiovascular
- Urology
- Head & Neck
- Trauma & Intensive Care
- Anaesthesia
- Upper Abdomen
- Gastrointestinal Tract

Physicians of all specialties will benefit from attending this congress. EUROSON 2015 provides them with the opportunity to meet, discuss, inform and be informed in all current trends of ultrasound. The highly specialised scientific and educational programme is a great opportunity for all to exchange views and experiences as well as learn from colleagues who are experts in their own field. These meetings also provide participants with updates on the latest technological developments and advancements of the industry, and guidelines for all ultrasound applications. All these factors make EUROSON Congresses the most valuable ultrasound event.

Recent developments in ultrasound technology have helped upgrade the medical field in a variety of ways. Ultrasound is portable, and thus can be used by doctors of all specialties.

Physicians can use ultrasound in their office, at the patient's bedside, in a primary care unit and in all hospital departments, including the intensive care unit and in the operating room. Ultrasound-guided interventions are used for diagnostic and therapeutic purposes; these are cost-effective therapeutic procedures that minimise the need for hospitalisation. Therapeutic ultrasound is an efficient therapeutic tool in many critical medical conditions.

Ultrasound now more than ever is a powerful tool, which can be applied in all medical fields for prevention, diagnosis and therapy. EUROSON 2015 will cover all innovative and current applications of ultrasound. The prerequisite for the credible and efficient use of ultrasound is education and training. EFSUMB via its website offers a comprehensive collection of learning tools. EFSUMB has long recognised the need, not only to establish the infrastructure for training, but to provide clearly categorised modular learning material for continuous professional advancement. Teaching ultrasound via e-learning, by using the website, or during the congresses can cover only the theoretical aspects of education. Lectures given in convention centres or the provision of comprehensive material online are not enough for ultrasonography. The most advantageous learning method to understand and master ultrasound is hands-on training.

### Practical Courses Offer Hands-On Training

The EUROSON 2015 Organising and Scientific Committees have enriched the programme with hands-on training, by providing practical courses, which give step by step how-to instructions and hands-on training on real ultrasound equipment. Physicists, biochemical engineers, sonographers, application specialists and expert

physicians in each field will combine forces to teach, train and share their own tips and tricks on ultrasound diagnostic and therapeutic applications.

### Comprehensive Programme

EUROSON 2015 Congress represents the most advanced, elaborate, well organised and highly educative ultrasound meeting in the world. It offers every attendee a unique opportunity to debate on controversial issues, discuss important professional challenges, and review the current situation in all basic and advanced topics of modern ultrasonography. With so many educational and scientific sessions containing vital clinical information and cutting edge science, it is no wonder that the Congress has become a global event rather than a purely European one.

The wide selection of categorical courses, refresher courses, practical courses, special focus sessions, scientific sessions, invited lectures, how-to-do/practical courses, multidisciplinary sessions, plenary sessions and scientific sessions offered this year covers a huge range of hot topics that is sure to cater the needs of each attendee. We hope that all participants will take advantage of the beneficial value of coming together with friends and colleagues from around the world and most importantly to personally meet and learn from expert physicians and Europe's finest ultrasound educators.

We sincerely hope that this congress will be a forum for exchanging freshly acquired knowledge, for sharing scientific ideas, for inspiring new research and for making new contacts for further collaboration. As a result, EUROSON 2015 will contribute to the further development and improvement of our favourite technology – ultrasound. We hope you will enjoy EUROSON 2015 and look forward to welcoming you to a scientific meeting of substantial educational and informative value.

# EUROSON HIGHLIGHTS

## Saturday 7 November

EUROSON 2015 incorporates the 11th Congress of the Hellenic Society of Ultrasound in Medicine in Biology. Presentations on skin and nerve ultrasonography are the focus of Romania meets Greece on Saturday 7 November while Latvia meets Greece the same day in a session on vascular ultrasound.

The European Society of Radiology and European Federation of Societies of Ultrasound in Medicine and Biology (EFSUMB) presents a session on advances in diagnostic ultrasound – better results through integration. EFSUMB is presenting new ultrasound guidelines during the congress. EFSUMB also offers a session on US in paediatrics: paediatric registry status, safe use of contrast agents, emergency US, interventional US in arthritis and fetal medicine and contrast-enhanced ultrasound (CEUS).

The European Society of Neurosonology and Cerebral Hemodynamics (ESNCH) has a joint session on neurosonology topics that include stroke, contrast ultrasound and a practical demonstration of transcranial colour-coded duplex ultrasonography. ESNCH will also present new guidelines.

On Saturday morning there are also separate sessions on CEUS, and on intestinal US (IUS). The IUS session includes presentations on problem-solving, how to use it, inflammatory bowel disease and occlusion.

## Sunday 8 November

The German Society for Ultrasound in Medicine (DEGUM) presents a session on obstetrics, gynaecology and breast US. The following experts will give invited lectures as part of a categorical course:

- Lars Bolvig, Denmark - US examination of the hip with and without prosthesis (Hans Henrik Holm Lecture, CC 3.A MSK)
- Fabio Piscaglia, Italy - Point of care ultrasound in liver disease for the modern hepatologist (World Federation for Ultrasound in Medicine and Biology Lecture, CC 5.B Upper Abdomen)
- Torben Lorentzen, Denmark - Interventional ultrasound, 2015 Update (EUROSON Lecture, CC 10.A INVUS)
- Dirk Becker - CEUS in combination with endoscopic ultrasound (DEGUM Lecture, CC 10.C INVUS)

For more information, visit [www.euroson2015.org](http://www.euroson2015.org)

## Latex gloves make great balloons but they make lousy probe covers.

Sure, exam gloves are always close by, but using one as a probe cover is awkward, especially with a large 3D/4D probe. They also allow for wasted ultrasound gel, make an incredible mess, and if the glove is latex, it may cause an allergic reaction in patient, clinician, or both. You, your ultrasound probe, and most importantly your patient deserve better. The Eclipse® 3D, Parker's newest probe cover, was designed solely for 3D/4D probes. Save the gloves for their intended use or for decorating the next office party.

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# LATEST RESEARCH

## ELASTOGRAPHY OF THE CERVIX TO DETECT EARLY LABOUR SIGNS SHOWS PROMISE

Newly published research raises the possibility of using elastography to detect cervical stiffness changes that indicate an increased risk of preterm labour in pregnant women. Currently stiffness is assessed by manual palpation of the cervix, a subjective measure, whereas elastography allows quantitative measurement. *HealthManagement.org* spoke to lead author Marie Muller, assistant professor of mechanical engineering at North Carolina State University about this proof-of-concept study.

Muller and her colleagues used shear wave elastography (SWE) to take measurements of 157 pregnant women who were already scheduled for ultrasounds. The researchers found that patients between 24 and 35 weeks pregnant who had below average cervical stiffness were at higher risk

of going into preterm labour.

In SWE, stiffness is measured based on how fast a mechanical shear wave propagates through the tissue. The researchers found that if the wave was more than one metre per second below the baseline for a woman's gestational age, or how far along she is in her pregnancy, the woman was more likely to have a preterm birth.

Muller explained that the main advantage is that this technique potentially provides some information on the mechanical competence of the cervix, which is key for the prediction of preterm labour. Unlike other methods, SWE doesn't rely on arbitrary pressure applied by the operator, no additional set-up is needed and it can be performed during a routine medical examination. Their study showed inter-operator reproducibility. Muller also notes that although the SWE technique uses high-end ultrasound equipment the equipment can be used for normal prenatal examinations as well as SWE

assessments of cervical stiffness, which would mitigate additional costs.

Now the concept has been proved to be feasible, the next step is a longitudinal study to follow patients through their pregnancy, to allow researchers to understand how cervical stiffness changes and what changes may indicate early onset labour.

The research team have also conducted an animal study, which allowed the searchers to induce cervical ripening in a controlled fashion, and to subsequently observe the cervix using histopathology and other optical techniques.

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## ULTRASOUND FADE COULD BE EARLY DETECTOR OF PRETERM-BIRTH RISK

Researchers from the University of Illinois at Chicago (UIC) College of Nursing have published a study on ultrasonic attenuation, showing that it could indicate risk of premature birth.

Barbara McFarlin, associate professor and head of women, child and family health science, and colleagues,

predicted that an ultrasound exam would detect changes in water absorption and collagen makeup as the cervix remodels, offering a noninvasive way of measuring changes in the cervix that occur prior to delivery.

Current methods to predict risk of preterm delivery rely on measuring the length of a woman's cervix. McFarlin explained in a statement that cervical length assessment is of limited use, as most women with a short cervix deliver at full term.

In their study, published in *Ultrasound in Medicine and Biology*, almost 240 ultrasounds were performed on 67 African American women to examine cervical length and signal attenuation during the ultrasound exam. The analyses focused on the early gestational periods — from 17 to 21 weeks, and from 22 to 26 weeks.

At 17 to 21 weeks gestation, ultrasounds already showed significant differences in attenuation between

the group who later delivered prematurely and those who carried to term. There were no significant differences in cervical length between the two groups.

None of the women had a cervical length of less than 2.5 centimetres — the most commonly used cut-off to identify women at risk for premature birth who are candidates for progesterone therapy before 27 weeks of pregnancy.

"As the cervix changes from a firm to a supple, soft structure, estimates of attenuation from an ultrasound can provide clinicians with early tissue-based information, rather than waiting for symptoms of preterm birth," McFarlin said. "In the future, this can be a feature added to clinical ultrasound systems."

## Reference

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## ULTRASOUND TRACKING USED TO GUIDE FLEXIBLE NEEDLES

Flexible needles are ideal to reach their target in tissue, having sub-millimetre level accuracy. A doctoral student at the University of Twente has devised a robotically steered system which uses ultrasound tracking to guide the needle.

The system uses flexible needles with an asymmetric tip, which bend naturally when inserted into tissue. By performing a sequence of insertions and rotations, one can steer the needle in complex three-dimensional paths. The needle is controlled by a robot and tracked in real time using ultrasound images. This ensures that it is possible to adjust the needle's path and guide it through tissue with sub-millimetre level accuracy. Momen Abayazid's doctoral research involved the development of the robotic test-bed and the control that guides the needle as well as the 3D needle localisation algorithm using ultrasound images.

Abayazid has also developed a system that allows the clinician to have control. In this version the clinician inserts the needle, while being given guidance and cues by the robotic system with the help of vibrations and visual feedback. This could enable needle guidance from a clinician in a different location to the patients.

This system has been integrated with an ultrasound-based, automated breast volume scanner (ABVS). By combining the proposed system with a robotic, clinically approved ABVS system it is possible to bring robotic needle guidance from the research lab to the operating room.

According to thesis supervisor Prof. Dr. Sarthak Misra, Abayazid's research shows that the system is technically ready for application in humans, and he expects the first clinical trials to begin in three to four years. Mr. Abayazid performed his research at the Surgical Robotics Laboratory, which is part of the Department of Biomechanical Engineering of the UT research institute MIRA.



Image credit: University of Twente

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# PATIENT EMPOWERMENT CAMPAIGN

## PATIENTS PRESCRIBE E5 FOR SUSTAINABLE HEALTH SYSTEMS



**Nicola Bedlington**

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As European health services face an ageing population and an increase in chronic diseases, the challenge is to make healthcare sustainable. There is already a mismatch between available services and patient needs across the healthcare continuum, and many patients face fragmentation of care. Patient empowerment is one way to address this gap in moving from disease-centred to patient-centred care. The European Patients Forum (EPF) calls for the development of a strategy on this topic to make it a priority at EU-level, including an action plan on health literacy and high-quality information for patients on all aspects of their care.

The rise in patients living with chronic disease necessitates a shift in delivery from disease-centred to patient- and family-centred services. This approach combines self-management in the community with well-integrated professional support across the life span. It implies the empowerment of patients and their involvement at every level in the health system, ensuring active patient participation in policymaking and

in co-designing of care services to meet their needs more effectively.

### What is Empowerment?

EPF uses the definition that was developed for the EU Joint Action on Patient Safety and Quality of Care ([www.pasq.eu](http://www.pasq.eu)). Empowerment is “a multi-dimensional process that helps people gain control over their own lives and increases their capacity to act on issues that they themselves define as important.” Collective empowerment is “a process through which individuals and communities are able to express their needs, present their concerns, devise strategies for involvement in decision-making, and take political, social, and cultural action to meet those needs” (adapted from Luttrell et al. 2009 and the DUQuE “Deepening our understanding of quality improvement in Europe” project - [www.duque.eu](http://www.duque.eu)).

Empowerment is a process that is not necessarily continuous. Patients can feel empowered in one setting and unempowered in another, depending on the healthcare staff and organisational structures they encounter. Empowerment requires a shift from patients passively receiving healthcare to being active in and taking responsibility for their own healthcare and sharing the decision-making process with health professionals. Patients need access to high-quality information to be “health literate” and therefore make informed choices about their healthcare, and health professionals need the skills to work in partnership with patients.

### One Size Does Not Fit All

Patient empowerment cannot be imposed, but it can be facilitated. In some

circumstances, patients may not wish to be empowered, and prefer to leave decision-making to the health professional. In other circumstances, such as emergencies, patients may be unable to be actively involved. There may also be cultural differences amongst patients.

Equity of access and patient empowerment are closely interlinked. However, there is a risk that the style of empowerment approaches, if not carefully implemented, may worsen existing inequalities.

EPF’s position is that equity and empowerment are system issues: health systems and services should be designed to be empowering for all users, including disadvantaged or socially excluded patients. Application of patients’ rights and human rights generally should be ensured, such as meaningful informed consent focusing on the patient’s ability to make meaningful choice, rather than on legal protection of healthcare staff; effective mechanisms should be in place to ensure non-discrimination, both within and outside the health system.

EPF is developing a strategy to explore empowerment from the point of view of potentially vulnerable, socially excluded or marginalised groups, and to propose measures for ensuring patient organisations are inclusive. At system level, health inequalities need to be addressed via a comprehensive “Health Inequalities in all Policies” approach, including targeted strategies (for example health literacy) for specific groups.

### EPF Patient Empowerment Campaign

The European Patients Forum (EPF) has as one of its goals to promote the development and implementation of policies,

### EMPOWERMENT IS:

- A process (not static)
- Non-binary (there are degrees of empowerment)
- Non-linear (going ‘back’ as well as ‘forward’)
- Context-dependent
- Something that cannot be imposed by others, but can be facilitated
- Both individual (patient) and collective (the patient community)

Source: EPF (2015)



strategies and healthcare services that empower patients to be involved in the decision-making and management of their condition according to their preference, whilst raising awareness about their rights. EPF represents the interests of over 150 million patients across Europe.

In 2014 the European Commission commissioned the mapping study *Empowering Patients in the Management of chronic disease (EMPATHiE)* (EMPATHiE Consortium 2014), which aimed to better understand the concept of patient empowerment and to identify good practices, success factors and barriers across the European Union (EU). EPF led a work package

At the campaign launch conference on 20-21 May 2015 in Brussels, the participants took the first steps to formulate a "Charter of Patient Empowerment", the fundamental principles of patient empowerment in 10 points. The work on this Charter will in turn feed into the drafting of a multi-stakeholder Roadmap to Patient Empowerment that will provide the basis for concrete actions to be taken by European policymakers and healthcare stakeholders. EPF is also identifying best practices in patient empowerment and involvement for knowledge sharing and mutual learning. The Charter and Roadmap will be released in November 2015.



Patients prescribe E<sup>5</sup> for Sustainable Health Systems

Patients want to be part of the healthcare team.

From doing things TO the patients to doing things better WITH patients: patients' needs must be in the centre of healthcare.

Patients are expected to take a much more proactive role in managing their health and care, becoming ultimately "co-producers" of health in equal partnership with health professionals.

Patients cannot take responsibility of their health without being properly supported to be able to make informed choices.

#### 4. Experience

Individual patients work with patient organisations to represent them, and channel their experience and collective voice.

#### 5. Engagement

Patients need to be involved in designing more effective healthcare for all and in research to deliver new and better treatments and services.

#### Doing Things Better WITH patients

It is widely acknowledged that empowering patients is good for healthcare systems as it brings better health outcomes. Empowered patients take responsibility for their care in equal partnership with health professionals, take preventive measures, seek earlier diagnosis and adhere to treatment, which can reduce healthcare costs in the long run (Stone 2008).

Patient empowerment is a key element of future high-quality, patient-centred health systems. The slogan EPF has chosen for its campaign - Patients Prescribe - says it all: for the first time ever at EU level the patients drive a campaign on their empowerment. They are no longer passive, but are active, decisive and assertive people, ready to play their rightful role at collective and individual level. They call on EU decision-makers to develop an EU strategy on patient empowerment to achieve a real impact on the ground for the benefit of the 150 million patients with chronic disease whose interests EPF represents.

#### Further Information

To engage in the campaign, please visit [www.eu-patient.eu/campaign/PatientsprescribE/](http://www.eu-patient.eu/campaign/PatientsprescribE/) or contact [policy@eu-patient.eu](mailto:policy@eu-patient.eu) ■

## "PATIENT EMPOWERMENT NEEDS TO BECOME A PRIORITY"

that explored different scenarios for future European cooperation, revealing a strong need and desire for a patient empowerment European strategy.

In May 2015 EPF launched its Europe-wide patient empowerment campaign with the aim of promoting understanding of what patient empowerment means from the patient perspective among European political decision-makers and health stakeholders. EPF further calls on the European institutions to adopt an EU strategy on this topic relating to all aspects of health, from health promotion and prevention through to therapeutic options and self-management of chronic disease. Patients expect a strong commitment from EU decision-makers and health stakeholders to promote the empowerment and meaningful involvement of patients as equal and respected partners in the 'healthcare team'. The empowerment approach aims to realise the vision of patients as 'co-producers' of health and as integral actors in the health system in partnership with the healthcare professional.

#### Patients Prescribe – The Five Es

"Patients prescribe E5 for sustainable health systems" is the tagline of the EPF campaign to show that patients are active people who can, if supported, and according to their individual capabilities and situation, make a difference for the sustainability of healthcare systems. EPF also encourages supporters to use the Twitter tag #PatientsprescribE.

The five "Es" of Empowerment are Education, Expertise, Equality, Experience, and Engagement.

##### 1. Education

Patients can make informed decisions about their health if they are able to access all the relevant information, in an easily understandable format.

##### 2. Expertise

Patients self-manage their condition every day so they have a unique expertise on healthcare which needs to be supported.

##### 3. Equality

Patients need support to become equal partners with health professionals in the management of their condition.



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# PATIENT ACCESS TO DIAGNOSTIC DATA

## SATISFIED PATIENTS AND FINANCIAL SAVINGS

*Dr. Roberto Tarducci, Chief of the Medical Physics Dept, Santa Maria della Misericordia - Azienda Ospedaliera di Perugia, shares his thoughts on the progress of their project to enable remote patient access to their diagnostic data. This project is just the latest stage in its transformation of access to and storage of images from its radiology and nuclear medicine services, with the aim of enhancing patient care.*



**Roberto Tarducci**

Chief, Medical Physics Department  
 Santa Maria della Misericordia  
 - Azienda Ospedaliera di Perugia  
 Perugia, Italy

### Background

Santa Maria della Misericordia hospital in Perugia, Italy is the largest hospital in the region of Umbria (population 894,762 in 2015), serving residents from within and outside the region (see Figure 1). The hospital has more than 800 beds, and 41,160 patients were hospitalised in 2013. It is a reference centre for the region of Umbria as well as for adjacent regions. It is designated as a Highly Specialized Enterprise (Azienda di Alta Specialità), due to its high level of technology and the specialised professional staff who work there.

Since 2000 the Hospital has used an Agfa HealthCare Patient Archiving

and Communication System (PACS) and Radiology Information System (RIS) to optimise the efficient operation of its imaging services. Already in 2006 access to imaging performed by both the Radiology and Nuclear Medicine Departments was made available to all clinical departments in the hospital.

In August 2014 the Azienda Ospedaliera di Perugia and Agfa HealthCare signed an agreement to implement a data centre, including a cloud solution. This solution will make it possible to store data – images, reports, diagnostic results, ECG – from the various hospital departments

to their images. On March 1, 2015 Azienda Ospedaliera di Perugia activated this service, allowing patients remote access to their diagnostic data.

### Why did you decide to enable patient access to their imaging information?

We set out to make diagnostic results available to patients via the internet for several reasons. Patients are used to convenient access to information over the internet in their daily life, and we believe that medicine should not be any different. There are many bene-

## “MOBILE ACCESS IS AVAILABLE TO OUR PATIENTS AND IT IS HIGHLY APPRECIATED”

fits of making results accessible to patients. Accessing their own diagnostic results is more convenient for patients and their families in terms of time, and it also guards against possible loss of private data by other methods, for example in hard copy such as DVDs, which may be lost and/or get into the wrong hands. Visualisation is possible using numerous devices, and, not least, this method is environmentally friendly, because we are not using resources to burn and distribute DVDs with images.

in the cloud, with a high level of data privacy and security. At the same time, the Azienda Ospedaliera di Perugia decided to implement a patient portal, thus allowing patients access to their images and data, with the same high levels of data privacy and security.

### Patient Access to Images

After opening up access across the hospital, the logical next step was to initiate access to allow patients access

fits of making results accessible to patients. Accessing their own diagnostic results is more convenient for patients and their families in terms of time, and it also guards against possible loss of private data by other methods, for example in hard copy such as DVDs, which may be lost and/or get into the wrong hands. Visualisation is possible using numerous devices, and, not least, this method is environmentally friendly, because we are not using resources to burn and distribute DVDs with images.

Imaging exams per year	255,000
Images added to store per year	8-10 TB
Total images stored	40 TB
Technologies	
<ul style="list-style-type: none"> <li>• 1 PET/CT scanner</li> <li>• 2 MRI systems (at 1.5 and 3 T)</li> <li>• 6 CT scanners</li> <li>• 3 gamma scanners</li> <li>• 1 cyclotron</li> <li>• 3 linear accelerators</li> <li>• Tomotherapy accelerator</li> </ul>	

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### Why did you choose the Agfa HealthCare solution? What did you see as the advantages?

We chose Agfa HealthCare as our partner for RIS/PACS and hospital image distribution, because we found the solution to be both reliable and user-friendly. The main advantage is that Agfa HealthCare provides us with excellent integration among our different departments.

### What were the main challenges?

The principal challenges included guaranteeing the safe storage of data, and protecting against any possible risk of data theft.

Another key concern was to promote acceptance by hospital personnel of this change in their work practices. It was important to involve them in the decision-making process.

### What was the first step in implementation?

The first step in implementation was to instruct patients on the convenience in using this new service. Specifically, access is much simpler and loss of documents is no longer a risk.

### How did you inform patients about the imaging portal? How can patients access the portal?

There were some articles in the local press, which included some practical examples of cases. Also, at the end of each diagnostic test, patients are made aware of the possibility that they can obtain their test results directly from their personal devices.

### Is mobile access an advantage? Has the portal increased patient engagement?

Mobile access is available to our patients, and it is highly appreciated.



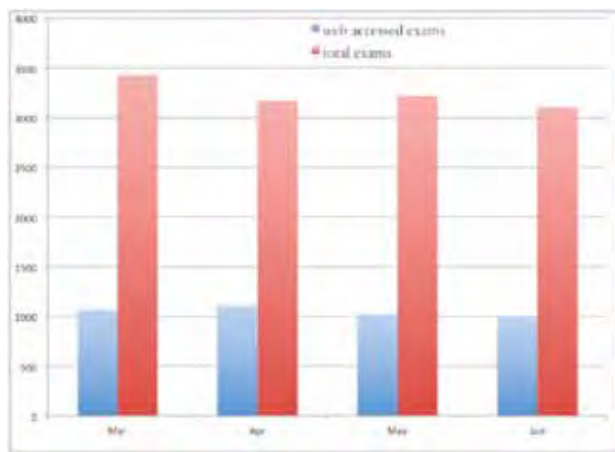
Santa Maria della Misericordia main entrance



Santa Maria della Misericordia aerial view

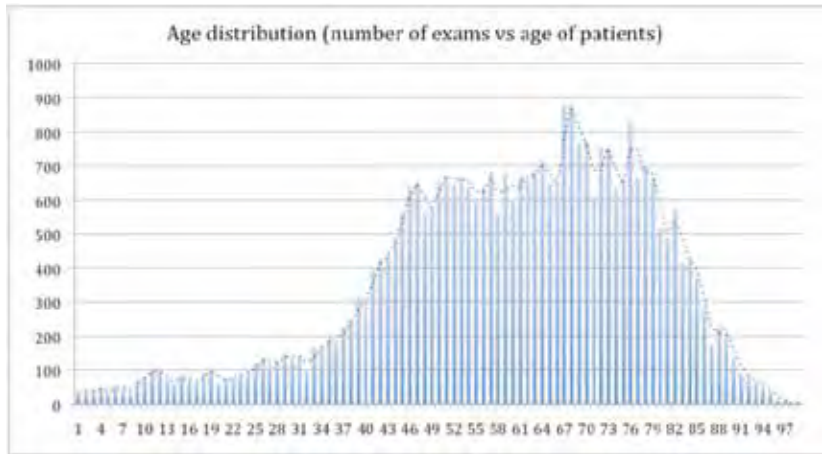


**Figure 1.** Percentage of patients from regions other than Umbria (light green)  
 Key: Red: > 20%, Blue: 15% - 20%, Green: 5% - 10%, Grey: < 5%.  
 Source: Azienda Ospedaliera di Perugia, Annual Report 2013



**Figure 2.** Web-accessed exams (blue) and total exams available online (red) over the first four months, 2015. The average web-access ratio was 32.4%.  
 Note: To understand the data we must take in account that in Italy the mean number of families with internet access is 62.7%, whereas only 33.5% of families use internet on a daily basis. Only 16.3% of elderly people have internet access. (Source: Annual report of the Italian National Institute of Statistics - ISTAT 2013).

**DISCLOSURE:**  
 "Point-of-View" articles promote Leadership Engagement and they are part of the HealthManagement.org Corporate Engagement Programme



**Figure 3.** Number of radiological exams at Santa Maria della Misericordia versus age of patients over the first four months of web-access service, 2015.

## “ACCESS IS MUCH SIMPLER AND LOSS OF DOCUMENTS IS NO LONGER A RISK”

Patients express their appreciation of the fact that their data has been made more accessible, which suggests that this change has allowed them to feel more involved in the medical process. For patients who are accustomed to daily use of the internet the portal is more friendly than the classic system comprising paper report and DVDs. For older patients, or those less accustomed to use of the internet, online access is a great effort and they normally prefer the traditional method.

### Have you quantified the return on investment (ROI)? For example, the time and money saved by not burning and posting CDs and DVDs, or any other measures?

We have calculated a 10% annual financial savings in terms of spending on the production of CDs and DVDs. Likewise, the number of patients returning to the hospital to pick up their test results has declined, suggesting that they are also saving time and money.

### You anticipated a significant impact on emergency care. Have these been realised through having immediate access to patient’s previous imaging?

The hospital of Perugia has the largest emergency structure in the region and the RIS/PACS/imaging distribution is set up very well: the data of radiological emergency patients are immediately available within the hospital.

### What are the next steps and future plans?

- We would like to do the following:
- Render the complete imaging archive accessible to patients; currently only the latest exams are available for consulting;
  - Extend the service to the other hospitals throughout the region of Umbria. This project has been the model to integrate data centres from other hospital sites in the region;
  - Make instant messaging available to remind patients of future appointments. ■



# PATIENT PORTALS IN PRACTICE



Patient portals are secure online websites that offer patients access to personal health information. Basic portals (portals 1.0) are windows into electronic records, built into or added on to existing electronic health records (EHR). Portals 2.0 have advanced functionality, including health information exchange and web 2.0 capabilities such as social networking. These enable patients to make appointments, view test results, discharge summaries, prescriptions or patient information material, update contact information, make payments and exchange secure email with healthcare providers. The U.S. government's HealthIT.gov website declares: "With patient portal implementation, your organization can enhance patient-provider communication, empower patients, support care between visits, and, most importantly, improve patient outcomes" ([www.healthit.gov](http://www.healthit.gov)).

A 'pull' factor for patient portals is patient empowerment. Patients and their families expect online access to their healthcare services similar to what airlines, retail stores and banks offer, for example. In the U.S. federal incentives provide the 'push' factor that obliges healthcare facilities to provide portals. Meaningful Use (MU) refers to a U.S. federal government incentive programme promoting implementation of EHR. From 2014, U.S. healthcare services received incentives for having 50% of their eligible patient population registered for access to a patient-facing portal website linked to the EHR; having 5% of their eligible patient population actively viewing, downloading, and transmitting health information through the portal; and providing patient educational materials on these websites. Due to slow take-up, the programme granted a one-year extension until the end of 2015 for systems to meet early patient engagement goals. Lyles and colleagues (2015) argue that impediments to greater use appear to be issues with usability and medical jargon and language written at a level requiring high educational attainment. They write: "Healthcare providers

often find themselves in the uncomfortable position of needing to comply with the meaningful use mandate and therefore delivering EHR-generated visit summaries that are full of medical jargon, do not reinforce their recommendations, and do not enhance comprehension." They recommend that physician advocate for improvements in portal usability and that the government body overseeing the programme, the Office of the National Coordinator for Health Information Technology (ONC) supports usability testing among diverse populations with significant health needs, creates standards for literacy and language appropriateness for patient information, and provides incentives for broader implementation of portal interfaces in multiple languages.

## The Evidence

In theory, patient portals benefit both patients and healthcare services. Staff time is saved when patients book appointments online, for example. Against this are offset the costs of support and maintenance of the portal. Patient satisfaction has been shown to increase when secure messaging with healthcare staff is available, but it can add to staff workload (Shenson et al. 2015). While patients over 65 do use patient portals, questions remain about how to facilitate access by proxy for caregivers of patients who are unable to access portals directly, but who wish to retain control of their information (Crotty et al. 2015).

Providing access to a patient portal is a way to engage patients in their own healthcare. A review by Irizarry and colleagues (2015) published in the *Journal of Medical Internet Research* explored research on patient engagement through patient portals. Research has found that interest and ability to use patient portals is linked to age, ethnicity, health literacy, level of education, health status and caregiver role. People with disabilities and chronic illness, frequent users of health services and caregivers of elderly parents or children tend to be the most interested in

patient portals. Usability, such as easy registration and navigation, attention to privacy and security considerations and endorsement by the healthcare provider also enhance patients' ability to engage with portals. The top patient portal functions were regarded to be personalisation and collaborative communication between patients and providers. The authors note that it is important to evaluate health literacy and health numeracy "to identify specific risk factors and design flaws that could impact patient comprehension and the accuracy of patient input and interpretation of results." They add: "Ideally, interactive sites would collect information on individuals' health, health behaviours and personal goals, and assess health literacy and functional ability, which would then inform the adaptation of the patient portal to accommodate the needs of the individual and/or what additional or alternative resources may be useful."

Kruse and colleagues (2015a), in a systematic review of patient and provider attitudes toward the use of patient portals for the management of chronic disease, found that portals lead to improvements in self-management and improve the quality of care. The positives of portals included patient-provider communication, while the negatives were security concerns and user-friendliness. Cost was mentioned in only a few of the articles they reviewed, and they suggest that the incentives for meaningful use may lessen the cost barrier. The authors recommend that a standard patient portal design providing patients with the resources to understand and manage their conditions would improve portal adoption. In another study they reviewed the effect of patient portals on quality outcomes and its implications to meaningful use (Kruse et al. 2015b). Patient portal use showed a higher retention rate of patient loyalty and lower missed appointment rates. Portal use in the studies reviewed appeared to increase patient-to-provider communication without unduly increasing workload or office visits. However, results varied



**Claire Pillar**

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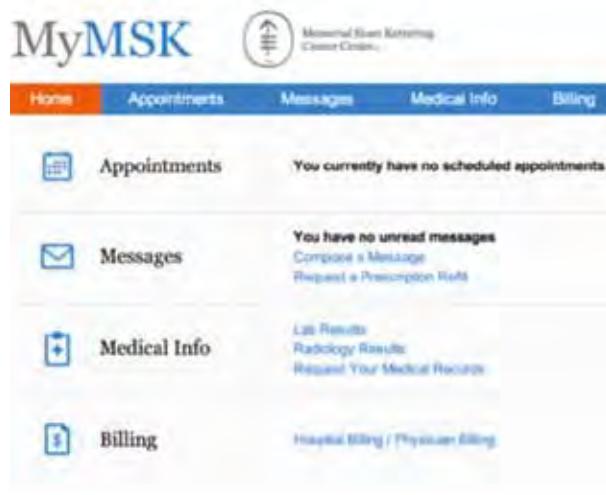
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Patients (n=508)		Referring physicians (n=48)	
Access to radiology results was easy	377 (74%)	Preferred reports to be auto-released after 1 week	28 (58%)
Access is important	446 (88%)	Releasing reports to patients is useful	42 (88%)
My doctor contacted me before my report was released	250 (49%)	Process did not affect workload	41 (86%)
I contacted my referring physician to discuss my report	126 (25%)		

Figure 1. Physician and Patient Survey (Henshaw et al. 2015)

eXray Portal Patient Evaluation (n=230)	
Would like to know radiation exposure after an exam	163/230
Expect exposure information to be available in Austrian EHR	183/228
Expect reduction of unnecessary exams	170/229
Expect improved communication between practitioners	118/229

Figure 2. Stakeholder Analysis - Patient Views  
Source: Neurohr and Seifter (2015)



MyMSK home page

on improved outcomes. They recommend that as most patient portal programmes are in their early stages, there is a need to benchmark their advantages. Their review did not examine the effect of Meaningful Use on portal use, due to insufficient data. They advocate that patient portals be implemented “to allow for fewer time-consuming encounters between patients and providers as well as to enhance the accuracy of information being exchanged” (Kruse et al. 2015b).

### Patient Portals in Radiology

Radiology is a clear candidate for patient portals. Image and report sharing can potentially eliminate duplicate exams, improve communication and save money by removing the need to produce and post CDs of images. Providing information to patients via a portal has challenges, however, according to a survey by Henshaw and colleagues published in the *Journal of the American College of Radiology* (2015). They surveyed patients and referring physicians following Kaiser Permanente Hawaii’s implementation of an online patient portal in which doctors could manually release radiology reports to patients (no images were included, but physicians can enter comments). The researchers also held a group interview with referring physicians to gauge the usefulness of releasing radiology reports through the patient portal, doctors’ preferences regarding automatic release, and the effect of releasing the reports on workloads. The survey assessed patients’ opinions on accessibility, importance of portal-released radiology reports, and communications with referring physicians prior to and following the release of the reports (see Figure 1).

More than half (58%) of the referring physicians favoured automatic release of x-ray reports (with a 1 week delay). Fewer were in favour of auto-release of CT and MRI reports. Most were in favour of communicating with patients when radiology reports were released, using the messaging function within the system, which includes smart phrases – standard text phrases entered with keyboard shortcuts. Asked if using patient-friendly language in reports would remove the need to communicate with patients when the report was released, most felt they still needed to communicate. They did not favour using simpler language, as reports would no longer meet their needs. However, they

felt that a standard format for the report would aid explanation of the results. In the case of more detailed reports, such as for CT and MRI, they believed that communication could include the most important information rather than including incidental findings.

The European Union project PATients Leading and mANaging their healthcare through Ehealth (PALANTE) included a pilot that enables patient access to a summary of x-ray examination dosages in a personal record (Neurohr and Seifter 2015). The eXray-Record extracts data directly from the hospital information system to calculate relevant results of exposure to radiation during examinations and the total acquired exposure in Styrian Hospital Cooperation (KAGes) hospitals. It is integrated into the patient portal of the KAGes and is accessed via the Austria Card. As of March 2015 over 1,400 physicians have accessed the record with their patients and 270 patients have accessed the record outside the hospital. Figure 2 shows patient expectations of the portal from a pre-implementation stakeholder analysis.

At the Hospital of the University of Pennsylvania (HUP) in the U.S., patient access to radiology reports proved popular, according to Seetharam Chadalavada, who presented at the Radiological Society of North America annual meeting in 2013 (Radiological Society of North America 2014). Between May 2012-March 2013 over 150,000 patients activated portal accounts. Patients read about half of the radiology reports available — comparable to lab result viewing. Release is delayed for three days, except in the case of mammogram reports, for which a summary in lay language is mandated. There was no change in the number of patient calls to clinics and radiologists compared to the period before reports were made available.

### Memorial Sloan Kettering Cancer Center MyMSK Portal

Memorial Sloan Kettering Cancer Center (MSKCC) in New York is the world’s oldest, largest private cancer centre. The centre has 471 beds and has 935 attending physicians and 2,221 nurses. In 2013, 138,338 patients were seen, there were 22,326 inpatient stays and 571,922 outpatient visits.

The MyMSK portal application was developed by MSK staff, and interfaces with many of MSKCC’s clinical backend systems, as

well as their own institutional database. The portal went live in November 2006. In 2012 MKSCC released a fully re-architected version 2.0, and in February 2015 the Center went live with an iOS mobile version of MyMSK, which has topped 5000 downloads since. In June 2015 the Portal was certified for Meaningful Use - View Download Transmit.

*HealthManagement.org The Journal* spoke to Kevin Shannon, Manager of Patient Portal Development, to find out more about their experiences in enabling patients to interact online with the Center.



My MSK app



Kevin Shannon  
Manager of Patient Portal Development  
Memorial Sloan Kettering Cancer Center

## Features

MyMSK offers access to lab test results, the ability to make appointments and secure messaging. Lab results go live when available. Radiology results have a delay of four business days, which gives physicians time to discuss findings with their patients. Patients can view medical information related to each encounter and securely transmit that information to other providers.

The Portal Secure Messaging application allows staff to view and reply to messages. The Information Systems department monitors usage and response time to make sure all messages are replied to within 48 hours. Users can also choose to send secure messages to the EHR to document communications when appropriate.

## Usage

Over the lifetime of the system nearly 70,000 patients have signed up to use the portal. MyMSK currently has 49,000 active users. In an average month almost 50% of those users log on at least once. An average of 53% of patients who have had an active treatment appointment in a month have a portal account.

## What's the feedback from patients on the portal?

Previous surveys always showed a high

satisfaction rate, and we feel our usage numbers show that patients find value in the application. We recently met with a group of Patient Advisors and the feedback is positive, but they suggest a lot of new functionality they would like to see.

## What future plans are there for the portal?

We are currently expanding the portal to be used by patients before they come in for their first visit, to help ease them through the process of scheduling an appointment. We are also looking at expanding our current integration with our Patient & Caregiver Education site ([www.mskcc.org/cancer-care/patient-education](http://www.mskcc.org/cancer-care/patient-education)) to allow for building patient care plans. We are also working on building and integrating an electronic forms system to allow patients to complete a base medical history form as well as provide surgical patients with pre- and post-surgery outcome surveys. In 2016 we hope to work on an Android version of the mobile app and start planning for our next major upgrade Portal 3.0.

## Have you evaluated the cost-effectiveness of the portal in any way, for example, telephone time saved in making appointments, reduced phone enquiries?

Although we know that secure messaging is popular and widely used (104,000 messages were sent in 2014), there has

not been any formal analysis. We also allow patients to confirm appointments online. When they do so it eliminates us making a reminder phone call. Also, nurses have noted that most questions now come via the portal and phone calls are less likely.

## Are there any lessons learned from implementing the portal that you are able to share?

There are many departments that have some involvement in what content is presented on the portal, such as Labs, Scheduling, Billing, Nursing, Physicians etc. We created a Portal Working Group to bring all these areas together to help prioritise development and to make sure the portal presented a unified user experience. As good as it is to have input, it's also good to have one sponsor/project manager to make the final decision.

We also made sure to build a support function for patients. Since go-live there has been a Portal Help desk, available by phone or secure message, to assist patients with any issues or questions. The help desk staff attend the developer meetings and provide any issues or feedback they get from patients. We have been able to resolve software issues in a short time-frame and get back to the patient to let them know their problem or suggestion has been addressed. I think that shows them how much we care that their experience with the portal is satisfying. ■



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# POWER TO THE PEOPLE

## HOW THE ECONOMICS OF INFORMATION IS EMPOWERING PATIENTS



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During the 2000s, England's National Health Service spent an extra \$1.5 billion per year in an attempt to bring its information systems into the 21st century. Over the decade that followed we spent around \$15 billion. That's a lot of money and there has been much debate about what all this money delivered. But there is an equally interesting question that is rarely asked: How much did ordinary people spend over this same decade on their own smartphones, PCs, laptops and broadband connections? If we assume that each household spent a rather modest \$600 per year and multiply that by the 25 million households across England for example, you find that the citizens spent around £150 billion over the same decade.

So citizens outspent the health service by a margin of ten to one on their digital infrastructure. Not what you were expecting perhaps but instructive. In digital terms, individual citizens are drawing farther ahead of the big hierarchical organisations that deliver goods and services (if you doubt this just ask yourself whether the kit you use at home is generally better or worse than the stuff you have to use at work).

Put another way, you could say that it has been much easier for citizens to access the benefits of Moore's Law, the observation that data density has doubled approximately every 18 months, than it has been for big organisations, especially healthcare organisations. Indeed the last 20 years has progressively placed the entire means of digital production at the disposal of pretty much anyone.

Marx said that it would take a revolution before the masses got their hands on the means of production but it turns out that Steve Jobs and Bill Gates were happy to sell the digital

means of production to us all for a very reasonable \$300. So now we've got the revolution. 'Voice' has been democratised.

Let's use one example of the new functionality that citizens now have at their fingertips – the ability to have a public voice – to explore two different ways of responding to this. In the olden days – also known as the 20th century – only elites had access to a public voice. The rest of us were limited to the occasional letter to the newspaper.

Now of course everyone can Tweet about your services, join a Facebook group about your institution or use Instagram to tell their friend just how clean – or dirty – your toilets are. The standard healthcare response to this democratisation of public voice is to treat social media as just another form of feedback. More data in, chomp it up as another form of Big data, shove the output in dashboards along with all your other Key Performance Indicators and

have opened the email alert that was sent to them. In addition, you can see how many members of the public have read it to date. This obviously reassures the author that their contribution has been heard. Much more importantly, it increases the power of their voice as staff and significant players across the local health economy can read it too.

Healthcare institutions tend to think that this kind of structured public conversation is just another form of feedback. It isn't. It's a way to construct new types of relationships with the people you are treating. Additionally, because each conversation is read several hundred times over the subsequent year, how you conduct yourself in these conversations is a powerful way of shaping your institution's reputation. Around five per cent of stories on Patient Opinion are highly critical but the public are now pretty sophisticated about online reviews. They know that some people have axes to grind, that hospitals and clinics have to deal with

**“THE TRANSPARENCY OF PATIENT OPINION  
MAKES IT WORK.”**

respond with wary formality.

So far, so familiar. But having a public voice can go much further. With Patient Opinion, the not-for-profit site that I founded, patients, carers and staff, can all share their experience of health and social care services across the UK. Staff get automatic alerts to relevant stories with authors getting a response about 60 percent of the time. Ten percent of stories result in an improvement being made.

The transparency of Patient Opinion makes it work. For example, you click on the Activity button next to the story and you can see that X people at Y institutions

emergencies and that healthcare is more complicated than staying in a hotel. So they treat the story itself with an element of reserve. By contrast your response is the real deal, evidence of whether your institution cares or is made up of faceless bureaucrats.

The point here is that the geography of the platform has a powerful effect on how people behave. Twitter has a geography that does little to inhibit trolls. By contrast Patient Opinion uses transparency to encourage staff and institutions to be more responsive to patient feedback.

One last point. There are two classic ways for the user of any services to

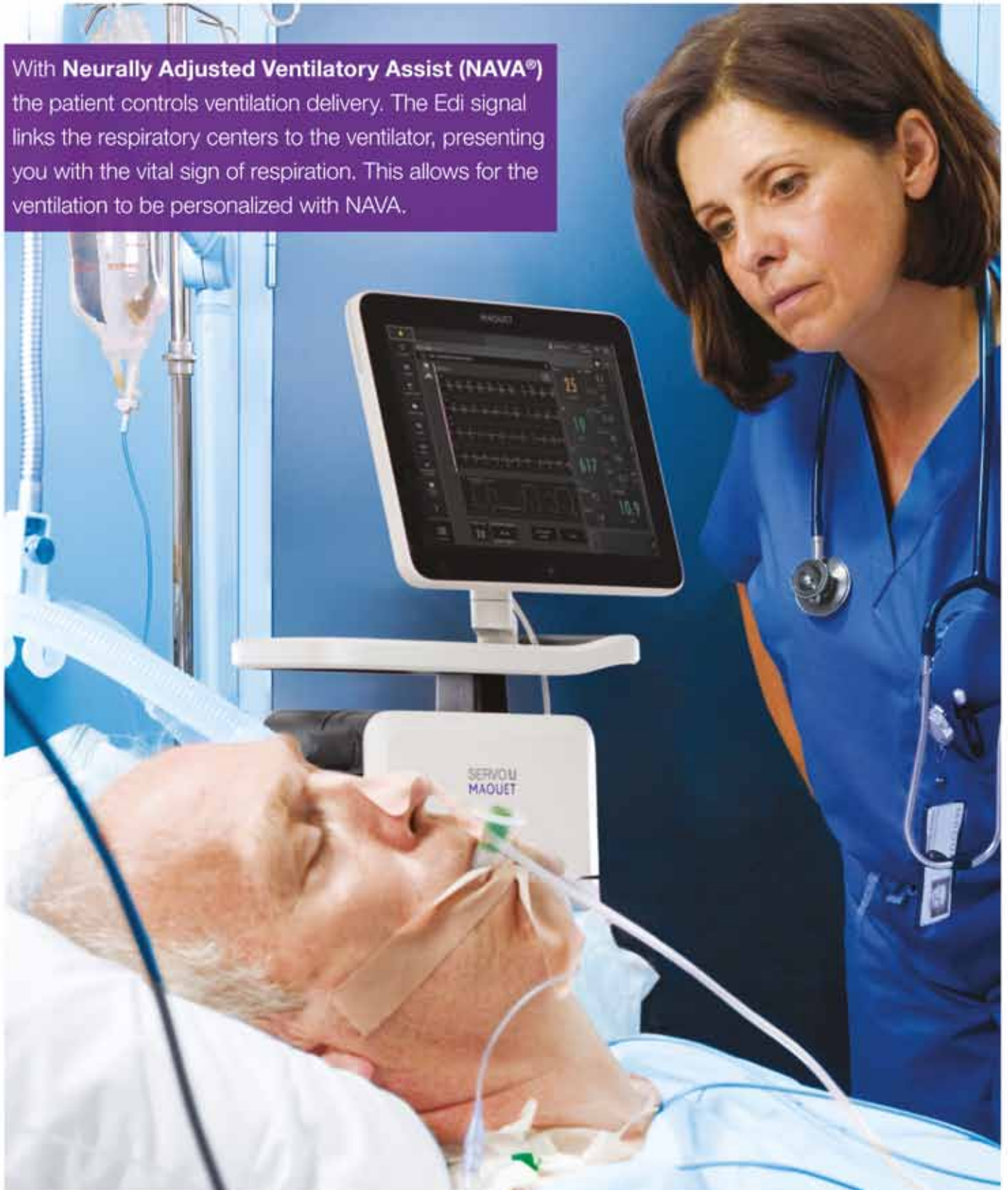
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## "She should have been transferred to palliative care"

About: Victoria Hospital / General Medicine - St Andrews Community Hospital

Posted by [JohnLS](#) (as a staff member posting for a patient/service user), last month

My wife died 2 ½ years ago with lung cancer but was in a stroke ward at the Victoria for 4 months and should not have been. She should have been transferred to palliative care.

She did not get the treatment she needed but also this was not fair on the nurses as they were not trained to care for patients with terminal cancer.

**CHANGE MADE**  
This story led to a change

**Story summary**

What's good? What could be improved?  
palliative care

**Activity**  
20 staff members have read this story

try and change things: exit and voice.

Exit is all about taking your custom elsewhere, about choice and market forces. Voice is about trying to change things by giving feedback, complaining, suing or volunteering. Over the previous decades, many healthcare systems have experimented with exit by extending choice and increasing market incentive whilst voice has remained a whisper at the policy table, more honoured in the breach than in reality.

All this is changing. The cost of markets is static or rising whilst the cost of voice is dropping like a stone. These economics mean that developments in your healthcare services in the coming years will be greatly influenced by patients collaborating together with you - or against you. ■

Dr. Paul Hodgkin is the founder and chair of Patient Opinion, one of the UK's leading independent non-profit feedback platforms for health services and partner with Oxford Health Experiences Institute at Oxford University. Founded in 2005, the aim of the platform is to encourage honest and meaningful conversations between patients and health services. A General Practitioner for 25 years before retirement, Dr. Hodgkin has contributed discussion papers to the UK Department of Health and the Cabinet Office and is a regular contributor on the impact of the web on Healthcare to British media.



# AUTOSOMAL DOMINANT POLYCYSTIC KIDNEY DISEASE

## REALISING PROGRESS THROUGH PATIENT EMPOWERMENT



**A**utosomal dominant polycystic kidney disease (ADPKD) is an inherited, chronic, progressive condition in which cysts develop in the kidneys and other organs (Torres et al. 2007; Chapman et al. 2015; Ong et al. 2015). ADPKD is an important cause of chronic kidney disease, accounting for around one in ten of all patients needing renal replacement therapy (RRT) via dialysis or kidney transplantation (Spithoven et al. 2014a). Approximately 50,000 people with ADPKD receive RRT across Europe, at an estimated cost of €1.5 billion/year (Spithoven et al. 2014a).

Kidney cysts develop throughout life in patients with ADPKD, causing symptoms and complications that include pain, abdominal distention, cyst infection and bleeding. Presentation and progression of ADPKD is highly variable, but on average patients commence RRT between 55 and 60 years of age (Spithoven et al. 2014b). Most patients with ADPKD also have liver cysts, and many other organs can be affected (see Figures 1 and 2). The disease has lifelong psychological effects that, together with physical manifestations, can reduce quality of life and affect work, social and family lives (Carr et al. 2014; Tong et al. 2015a; EAF 2015). Evidence suggests that many doctors may underestimate the impact that ADPKD can have on patients, even in the early stages (Carr et al. 2014).

Clinical practice for ADPKD diagnosis, assessment, treatment and support varies within and between European countries. There is a lack of evidence-based consensus guidelines, standardised care pathways and treatment options, and little coordination of care policies and services. The practical enhancement of patients' roles in decision-making, in their own care and more widely in the design and implementation of healthcare policies, systems and services, is central to efforts to address these issues (EAF 2015; Youssouf et al. 2015).

This article reviews recent developments in the field of ADPKD and highlights opportunities for patient empowerment within the context of policy-focused strategies to improve ADPKD care, recommended by an expert group called the European ADPKD Forum (EAF) (EAF 2015).

### Coordinated, Multidisciplinary, Patient-Centred Care is Essential

The EAF recommends the development of tiered care approaches to ensure that patients diagnosed with ADPKD have appropriate access to specialist, multidisciplinary management according to evolving best practice, and that patient organisations should be consulted to inform decisions regarding associated health policies (EAF 2015).

An example of such an approach is a model in which all patients diagnosed with ADPKD have access to a specialist nephrology centre where multidisciplinary, patient-centred care can be provided (see Figure 3 – available in online version). Referral to specialist centres would be encouraged for early prognostic assessment, genetic testing and the investigation and management of disease manifestations and complications. The expertise of specialists in hepatology, urology, cardiology and radiology should be available according to need, together with associated genetic counselling services. The coordination of specialist care would be expected to improve the efficiency of healthcare resource utilisation, for example through a more targeted use of novel diagnostic and therapeutic interventions (EAF 2015).

It is anticipated that some ADPKD specialist centres would be designated as Reference Centres that would undertake basic, translational and clinical research, medical education and the development and implementation of future clinical guidelines and best practice standards.

The EuroCYST initiative has established a network of 14 ADPKD centres in Belgium, Czech Republic, France, Germany, Italy, Netherlands, Spain, Switzerland, Turkey and the United Kingdom (<http://eurocyst.org>) (Petzold et al. 2014). Funded by the European Renal Association-European Dialysis and Transplantation Association (ERA-EDTA), the project aims to recruit 1100 adult patients to be followed for at least three years in an observational cohort study. An expanded European network of ADPKD Reference Centres would further facilitate research and the establishment of harmonised, integrated, patient-centred care pathways (EAF 2015).

### Patients Need to be Informed to be Empowered

Patients with progressive, lifelong diseases should be enabled to be fully active partners in their own care. Patients diagnosed with ADPKD, and their families, should be provided with reliable, simple, user-friendly, country-specific, written information on ADPKD in order to allow them to fully participate in decision-making (see Panel 1).

The UK PatientView ([www.patientview.org](http://www.patientview.org)) system, which provides patients with chronic kidney disease web-based access to their laboratory results (Woywodt et al. 2014), is an innovative approach to empowering patients that may be applicable to ADPKD. Patients' interest in such information is supported by an analysis of usage data from over 11,000 registered patients. More than half logged on twice a month on average during follow-up periods of up to four years (Phelps et al. 2014).

A survey of almost 4,000 patients from 36 European countries by the European Kidney Patients' Federation (EKPF) (formerly CEAPIR) found that almost two-thirds (64%) did not receive or could not remember receiving education on how to manage kidney disease in their daily life



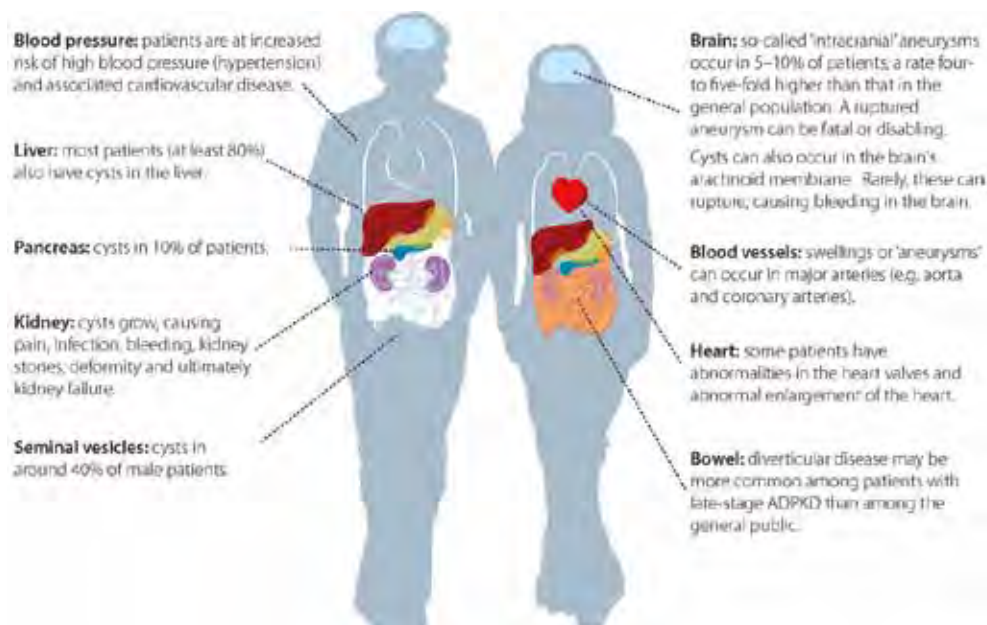
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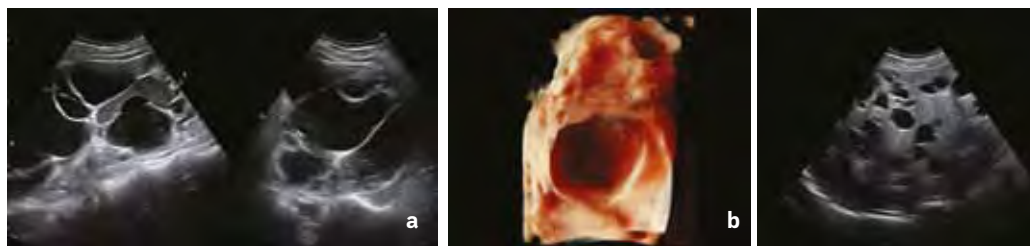


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**Figure 1.** Autosomal dominant polycystic kidney disease affects many parts of the body. Reproduced with permission from the European ADPKD Forum Report (EAF 2015).



**Figure 2.** Ultrasound images showing a) bilateral kidney cysts, b) kidney cyst on 3-dimensional ultrasound and c) liver cysts (lower) in a patient with ADPKD.

(Van Biesen et al. 2014). Patients with ADPKD should also have access to advice and support to help them deal with the impact of their condition on their mental health, relationships, employment, financial affairs and health insurance. Each person with ADPKD has a 50% (ie one in two) chance that any child he or she has will inherit the gene causing the disease. Reproductive counselling is vital to explain this risk and associated issues. Patients should also be routinely referred to patient organisations, which can provide further information and support.

### Managing Pain

ADPKD patients can experience acute and chronic pain, and often report that it affects their mood, sleep, relationships, daily activities and enjoyment of life (Oberdahn et al. 2014; Tong et al. 2015a). Qualitative research among patients suggests that physicians may not adequately appreciate the level of pain associated with ADPKD. Patients have reported that analgesic therapy is

often inadequate, and that they do not feel sufficiently involved in decision-making regarding pain therapy (Tong et al. 2015b).

Experts have proposed a management algorithm for chronic pain in patients with ADPKD, starting with conservative non-pharmacological measures, progressing to pharmacological, minimally invasive treatments and ultimately to complex, invasive therapies where necessary (Casteleijn et al. 2014). An interdisciplinary approach should be used to manage intractable pain, involving both pain specialists and nephrologists. Patients with chronic pain should also be assessed for depression and provided with appropriate treatment and support. It is hoped that this model will serve as an example for patient-centred pain care pathways in other countries.

### Reducing Cardiovascular Risk

Patients with ADPKD are at risk of high blood pressure and cardiovascular disease. Cardiovascular risk factor management has been credited with observed improvements in life expectancy in this

population (Spithoven et al. 2014a). However, evidence from Spain suggests that cardiovascular risk management is often suboptimal in patients with ADPKD (Gorritz et al. 2014), and initiatives for healthcare professionals and patients are needed to promote best practice and adherence (Chapman et al. 2015).

Results from the landmark, double-blind, randomised HALT Progression of Polycystic Kidney Disease (HALT-PKD) study have informed antihypertensive strategies in ADPKD (Schrier et al. 2014). 558 hypertensive patients with early stage ADPKD were randomised to rigorous blood pressure control (target 95–110/60–75 mmHg) or standard control (target 120–130/70–80 mmHg), and to an angiotensin-converting enzyme (ACE) inhibitor (lisinopril) plus an angiotensin-receptor blocker (ARB; telmisartan) or lisinopril plus placebo. Patients who received rigorous blood pressure control showed a 14% slower annual increase in height-adjusted total kidney volume (TKV) — a measure of ADPKD progression — than those with standard control (5.6% vs 6.6%;  $p=0.006$ ). Blood pressure in patients with ADPKD can be effectively controlled by blockade of the renin-angiotensin-aldosterone system, with benefits also on left-ventricular mass index and urinary albumin excretion. Dual ACE inhibitor-ARB therapy did not significantly benefit TKV versus lisinopril alone (Shrier et al. 2014).

### Dialysis and Transplantation

The costs of ADPKD care increase substantially when RRT is needed. RRT generally accounts for a disproportionate amount of healthcare resource utilisation and costs for all forms of chronic kidney disease. In the UK it has been estimated that only 2% of patients with chronic kidney disease need RRT, yet RRT accounts for 54% of all spending on chronic kidney disease (Kerr et al. 2012). Optimising RRT use is important to improve the cost-effectiveness of care as well as patient outcomes, especially considering that the number of patients receiving RRT for ADPKD in Europe increased by 60% between the periods of 1991–1995 and 2006–2010 (Spithoven et al. 2014a).

From the perspective of the healthcare system, kidney transplantation is far more cost-effective than dialysis (see Figure 4 in the online version). Haemodialysis — the most common RRT modality in patients with ADPKD — is estimated



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**Panel 1.**

Information provided to patients with ADPKD, and carers, should ideally include the following aspects

**At initial diagnosis**

- Explanation of the disease and its potential course
- ADPKD management approaches
- Measures to reduce cardiovascular risk
- Potential impact of the disease on work and lifestyle
- Family planning, including genetic counselling and pre-implantation genetic diagnosis
- Discussing ADPKD with employers
- Issues regarding health insurance and mortgage applications
- Registry entry and associated issues – all patients should be offered the opportunity to join an ADPKD Registry
- Details of ADPKD patient organisations

**Later in disease course**

- Prognostic information
- Dialysis and transplantation options: procedures, benefits, risks, etc

Source: EAF 2015

**Panel 2.**

Aspects of conventional ADPKD management

- Blood pressure control – protects against cardiovascular disease and slows kidney growth
- Increased water intake – may protect kidney function
- Dietary salt restriction – to help control blood pressure and possibly may help protect the kidneys
- Dietary protein restriction (at Stage 4 chronic kidney disease with severe decline in kidney function) – to avoid waste products of metabolism accumulating in the blood
- Avoid high caffeine intake (which may promote cyst growth)
- Weight control, including exercise
- Symptom management: eg pain
- Management of kidney complications: infection, kidney stones, bleeding into cysts
- Avoidance of activities that risk injuring the kidneys, such as contact sports
- Management of other manifestations: eg liver cysts
- Management of other cardiovascular risk factors, eg cholesterol
- Renal replacement therapy: transplantation or dialysis

Sources: Torres et al. 2007; Ars et al. 2014; Casteleijn et al. 2014; Chapman et al. 2015

to cost €55,500 per patient per year on average across Europe. While transplantation costs are similar in the first year, the annual cost associated with transplantation follow-up thereafter is estimated at around €12,000 (Spithoven et al. 2014a). There is a clear need for further promotion of kidney transplantation, including in patients with ADPKD, as part of EU efforts in this field (EAF 2015).

Results from the survey of kidney disease patients coordinated by EKPF suggests that three-quarters had been involved in the process of choosing their RRT modality, and that patients who were involved in selection were more satisfied with their treatment. Respondents were more often satisfied with information provided on in-centre haemodialysis (90%) and transplantation (87%) than on peritoneal dialysis (79%) or home haemodialysis (61%) (Van Biesen et al. 2014). A large international survey of patients undergoing haemodialysis also revealed information provision to be among the aspects of care with which patients were least satisfied (Palmer et al. 2014).

**New Approaches to Disease Modification**

Treatments that can slow cyst development in patients with ADPKD, thereby delaying kidney failure, have the potential to reduce the need for costly and invasive dialysis or transplantation. Although a variety of approaches are conventionally taken to protect the kidneys (see Panel 2), these do not appear to be effective in delaying the need for RRT in patients with ADPKD (Spithoven et al. 2014b).

Treatments to slow ADPKD progression are urgently needed to maintain patients' quality of life and delay the need for dialysis and transplantation. In May 2015, tolvaptan, a vasopressin-2-receptor antagonist (Torres et al. 2012), was granted market authorisation for use to slow the progression of cyst development and renal insufficiency of ADPKD in adults with stage 1 to 3 chronic kidney disease at initiation of treatment and with evidence of rapidly progressing disease. Tolvaptan treatment must be initiated and monitored under the supervision of physicians with expertise in managing ADPKD and a full understanding of the risks of tolvaptan therapy, including hepatic toxicity and monitoring requirements (Otsuka 2015). Other investigational disease-modifying agents are in development (Chang & Ong 2013; [www.clinicaltrials.gov](http://www.clinicaltrials.gov)).

Patients have a vital contribution to make to the processes of medicines regulation and healthcare technology assessment (HTA). In particular, patients can provide unique insights into the disease impact, existing unmet needs and risk-benefit assessment of new medicines. The European Medicines Agency (EMA) includes patients on its Scientific Committees. However, patient involvement in HTA is highly variable. While there are examples of good practice (HTA International 2015), patients in some countries are afforded little or no input into decisions that could profoundly affect their lives. The EAF has called for HTA bodies to seek to engage patients and patient organisations in assessments according to published standards (EAF 2015).

The development and introduction of new therapies for ADPKD will necessitate the identification of patients who will benefit from treatment, in order to guide individualised treatment and monitoring, and to aid study recruitment. It has been recommended that governments support measures for routine prognostic assessment in patients with ADPKD (EAF 2015).

The progression of early ADPKD cannot be monitored by conventional measures of chronic kidney disease (eg the glomerular filtration rate). Research is ongoing to refine and validate predictive tools, based on the TKV, genetic testing and other variables, for use in clinical practice and clinical trials. ADPKD results from genetic mutations in one of two genes, PKD1 and PKD2. Mutations in PKD1 account for 85% of cases of ADPKD where a mutation is identified, and are associated with a more severe and progressive disease course. Genetic testing to identify the causative mutation can be used to confirm the diagnosis in some situations, particularly in children (Chapman et al. 2015), and for kidney donor assessment in a relative of someone with ADPKD (Sims et al. 2014). Use of genetic testing is limited in part by its complexity and cost and the need for genetic expertise. The recent development of faster and cheaper 'next-generation sequencing' tests may lead to a greater role for genetic testing both in diagnosis of ADPKD and in assessing prognosis. Standardised reporting, as well as physician education and genetic counselling for patients, will be needed to optimise the use of new tests (Chapman et al. 2015).

## Defining Priorities for Research

Patients should not merely be the subjects of medical research, but be actively involved in the design, commissioning and conduct of research, and in the review and dissemination of its findings. According to a recent systematic review, only 25% of studies that elicited stakeholders' priorities for research in kidney disease explicitly involved patients (Tong et al. 2015).

The lack of established international clinical guidelines for ADPKD management is due in part to limitations in the evidence base. A Kidney Disease Improving Global Outcomes (KDIGO) Controversies Conference Report, co-developed by healthcare professionals and patient representatives, has evaluated this evidence base and defined the outstanding research needs with a view to the development of future clinical guidelines (Chapman et al. 2015). From a patient's perspective, there is a pressing need for the development of specific patient-reported tools to measure the psychological impact of ADPKD and studies to evaluate strategies to manage the associated anxiety and depression. Other research needs include the development and assessment of standardised care pathways and communication tools, and studies

to evaluate lifestyle approaches to disease modification and impact of ADPKD centres on outcomes and costs (Chapman et al. 2015).

## Conclusion

This is an important time in the ADPKD field. Several ongoing developments offer the potential for new standards of care, but national and international collaborative efforts that involve and empower patients are needed to ensure they translate into benefit for patients across Europe. To this end, the EAF aims to facilitate dialogue and collaboration between patients and their representative organisations, nephrologists and other specialist physicians, geneticists, healthcare system managers, national government health ministries and bodies responsible for medicines regulation and HTA.

## Acknowledgements

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at [www.pkdinternational.org/EAF\\_ADPKD\\_Policy\\_Report\\_2015](http://www.pkdinternational.org/EAF_ADPKD_Policy_Report_2015).

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## Key Points

- ✓ Patients diagnosed with ADPKD should have access to specialist, multidisciplinary management according to the evolving best practice.
- ✓ Patients and their families should be provided with reliable, simple, user-friendly, country-specific, written information on ADPKD, together with advice and support to help them deal with the impact of the disease.
- ✓ Patient-centred approaches are needed to improve the management of the various manifestations of ADPKD, including pain and hypertension, according to current best practice, and to promote kidney transplantation for patients with end-stage kidney disease.
- ✓ Health technology assessment authorities should seek to engage patients and patient organisations in assessments of new treatments.
- ✓ Patients and their carers or families should not merely be the subjects of research, but should be involved in all stages of research, including priority setting.



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# REGINA HOLLIDAY AND THE WALKING GALLERY



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**P**atient Activism, Patient Advocacy or Patient Engagement. Whatever label you give it, one thing is for certain: the movement towards Patient Power is central to the future of healthcare. While patient activism pre-dates the explosion of the web, the trend towards patients participating in their own healthcare goes hand-in-hand with the development of eHealth and mHealth as patient advocates use cyber space to inform, support, empower and inspire on the subjects of everything from cancer care for young people to multi-disciplinary care, organ donation to lupus, medical technology innovation to the effects of chemotherapy. Patient Activism is not solely focused on patient care; it is also impacting on policy and, when working hand-in-hand with a scientific perspective and input, has the power to open new vistas in healthcare.

Many patient activists are or were patients themselves or are close to patients. This experience has fuelled their initiatives. Artist Regina Holliday is one such activist and speaker. During her husband's illness with metastatic kidney cancer, she encountered brick walls trying to get hold of his medical records. After her husband passed away from the disease, she made it her mission to advocate for patient rights – largely through The Walking Gallery of Healthcare. *HealthManagement.org* had the pleasure of catching up with her.

## If you had to describe what you do with The Walking Gallery to someone new, how would you explain it?

An artist or artists interview medical professionals and lay individuals to form a patient-centric narrative. The artist then creates representational imagery and paints that picture story upon the business jacket of the provider of the narrative account. The provider of the patient story, aka "Walker", will wear the jacket to medical conferences and events in order to disseminate the patient story to a large group of policy-minded attendees and to represent the individual patient voice in venues where they are underrepresented. Further, both artist and Walker will support the spread of the story and image via social media.

This is the fourth year of the Walking Gallery of Healthcare. We now number 357 members walking around the world with patient story paintings on our backs. There are now 43 artists in the Gallery.

This Walking Gallery is changing minds and opening hearts. Walkers are attending medical conferences where often there isn't a patient speaker on the dais or in the audience. They are providing a patient voice and by doing so, are changing the conversation.

## What was your first happening?

Our first gathering was June 7, 2011. We had 56 walkers and 5 artists.

## What inspired you to start The Walking Gallery?

The Walking Gallery exists because of three moments of inspiration: Firstly, on June 29, 2009 I attended my first medical conference entitled Connect 2009. I noticed the people with the power wore business suits. Secondly, after a social media exchange with Tech investment developer Jen McCabe, she asked me if I would paint a series of paintings on the back of her blazers to wear to upcoming health meetings. I told her I would be honoured to paint jackets for her.

Lastly, in April 2011, I attended the opening of the Kaiser Permanente Centre for Total Health in DC, I asked them to host an art show there, but not on the walls.

On that night, a space that is a shrine to technology and the power of electronic communication became a Gallery and the art walked. Over 50 people walked around that space wearing patient stories on their backs. I saw something amazing happen; they became their story. I saw doctors throw aside being defined by their profession. I saw administrators and government employees drop their distancing titles and simply be the patient that they were. I saw teachers talk with CEOs and artists meet programmers and all were connected through their stories.

In every blog post and tweet I have read about the impressions of the Walking Gallery, I hear the same things again and again. It is electric, passionate, fiery and so very filled with positive energy and we are filled with the spirit of change. That day we became a movement. We now walk and spread the message.

## What are your proudest moments in terms of the impact you have had on patients and healthcare?

I was honoured to testify for Meaningful Use (in the U.S. the use of the certified electronic health record technology to improve care quality and safety and engage patients). I was also honoured to take part in the healthcare reform debates in the U.S.

## What, in your view, is the most critical issue facing patients today and do you intend to highlight it with The Walking Gallery?

Including the patient voice in the wider discussion of medicine and health policy is the most important thing that The Walking Gallery can highlight. We do not represent one concern or disease; we represent them all.

## What keeps you going with The Walking Gallery?

I love being completely inclusive in my activism and The Walking Gallery is a wonderful vehicle for that.

Find out more about Regina Holliday's work at: [www.reginaholliday.blogspot.com](http://www.reginaholliday.blogspot.com) ■



Photo credit: Ted Eytan



# RISING TO THE CHALLENGE OF PATIENT-CENTRED CARE



After an hour of describing a recent admission to hospital for treatment of pneumonia, 'Mary' paused and said "You know, I couldn't fault the technical care, but...I was treated like a lump of clay...people came and went...they did things to me ... staff didn't tell me what they were doing, who they were or how I was going...and that is my lasting memory of my care." 'Patient-centred' has become a catchphrase being used liberally in healthcare policy, guidance and local management strategy. Yet how truly focused on patients are current efforts? To what extent do these endeavours engage patients in planning and making improvements?

The history of healthcare services sheds some light on the lack of 'customer' engagement in healthcare improvement. In the acute sector, the military legacy can be traced back to about 100 BC when the Romans established hospitals (valetudinaria) for the gladiators, slaves and sick and injured soldiers. Modern clinical language still uses terms based on a military model of healthcare delivery (eg 'discharge' and 'triage'). Yet the patients have changed, with a shift towards largely chronic conditions linked to the increasing burden of ageing populations.

While we may acknowledge that change is needed, making it happen in a complex, well-established system is difficult, and requires new approaches to tackle resistance. Healthcare services that have taken a strategic, organisation-wide approach to patient-focused change have witnessed benefits for patients, clinicians, management and operational metrics (eg cost savings, staff satisfaction, improved staff retention rates). Research highlights the importance of health services taking a comprehensive approach by noting the positive association between patient experience, clinical outcomes and resource utilisation (eg impact on length of stay).

One such approach is to recognise the challenge presented and to take a

long term strategic view of transforming services as they 'rise to the challenge'. The Clinical Excellence Commission in New South Wales (NSW), Australia, developed and issued such a challenge to healthcare services within the state in 2012. Working with a range of stakeholders to develop the Patient Based Challenge, including patient advisers, clinicians, policymakers and managers, 26 strategies were recommended under 9 key domains (see Box).

Aligning with new local service accreditation standards, strategies emphasised the importance of engaging with patients, families and carers at the bedside as well as in organisational governance. In recognition that attaining a patient focus within a service can take 5-10 years to achieve, it was suggested that health services initially implement 2-3 strategies, supported

by an online guide and local education and meeting sessions involving experts from the Commission. The Challenge was designed to provide a strategic framework to health services based on evidence of effective approaches used by high performing patient-centred services.

Regions within the state of NSW, divided into geographic districts, took up the Challenge by signing up at Board level as an indication of governance support and executive commitment. Being a flexible framework, service districts selected their own priority areas for initial focus and used a range of tools to implement change. Health services reviewed local data sources about patient experience (eg patient surveys, complaints and complaints), incidents and staff satisfaction to help determine areas for improvement. Engagement of local clinicians, patients and carers

in subsequent changes was crucial to success.

Changes put in place as a consequence of rising to the Challenge included reviewing local service policies to determine patient focus. For example, services that received negative feedback about patient visiting hours conducted focus groups and surveys with patients, family and staff to gain a greater understanding of the issues from the service user perspective. On reviewing current visiting policies and auditing facility visiting hours across the district, an inconsistency in current approaches became apparent. Taking up the challenge to implement a patient-based visiting policy resulted in district-wide policy change endorsed by the governing Board and the introduction of a flexible patient-focused approach to visiting. One district introduced a care



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## “ENGAGEMENT OF LOCAL CLINICIANS, PATIENTS AND CARERS IN SUBSEQUENT CHANGES WAS CRUCIAL TO SUCCESS”

partner plan with 24/7 access rights. Local evaluation conducted after the policy change found high levels of satisfaction attained amongst both patients and staff as a consequence of the new approach, which valued family and carers as care team members.

Other districts actively involved patient advisors in the co-design of new processes, new services and facilities. In a broader recognition of the health literacy barriers presented to patients by health services, local health districts undertook patient shadowing activities to experience navigation and signage issues from the patient perspective (ie 'walk in my shoes'). Other services that had witnessed previous incidents of 'missed deterioration' of patients chose to implement the Clinical Excellence Commission's programme for patient and family activated escalation ("REACH"), empowering patients or

family to call for emergency help through direct access to a rapid response team.

Internationally, health services are recognising that they can transform the patient experience through strategic and lasting improvements within their facilities. Many such changes can at first appear confronting, as they challenge us to think differently about healthcare delivery and governance. Examples from around the world include:

- Open Notes (providing patient access to clinician notes within medical records via online portals);
- Patient involvement in clinical staff selection panels for new appointments to healthcare delivery services;
- Patient Preferences Passport (Planetree tool for capturing patients' personal preferences relating to their healthcare, health and goals promoting partnership between patients and healthcare professionals); and
- Real-time text messages within hospital (eg SMS from operating theatres to family members to inform them of progress with the patient's surgical procedure or pre-admissions reminders).

## Conclusion

We know that quality in hospital settings is affected not only by the quality of technical care received, but also by the quality of the interpersonal relationships and the degree of engagement with the 'customer' of the service. At the same time, patient expectations of quality service provision are on the rise. As Mary's story points out, patients want more than good 'technical' care and a good clinical outcome. High performing health services are providing safe and reliable care that is also patient-focused. The next time you hear the words "Of course I'm patient-centred, what else would I be? I'm a doctor!" – stop and ask "But are we *really* patient-centred...?" ■

## THE PATIENT BASED CARE CHALLENGE

### 1. Leadership commitment

- a) start each board meeting with a story of patient care from your service.
- b) spend more than 25% of the board's meeting time on quality.
- c) arrange for board and executive members to visit wards regularly to talk with staff and patients.
- d) provide training to senior leaders to champion patient-based care.
- e) involve patient advisors in strategic planning processes.

### 2. Communicate the mission

- a) develop and promote an organisational mission statement that embodies patient-based care values.
- b) communicate the mission to new staff at orientation – illustrating leadership commitment.
- c) share personal stories by senior leaders to engage staff in patient-based values.

### 3. Engage patients, family and carers

- a) involve patients, families and carers in governance through committee membership, including quality and risk management and advisory committees.
- b) involve patients, families and carers in process co-design, design of new facilities and staff interview panels.
- c) implement a patient-based visiting policy.

### 4. Support engagement to transform care

- a) encourage staff to view patients, family and carers as care team members.
- b) implement processes to support patient/family activated escalation of care for deteriorating patients.
- c) conduct handover at the bedside and involve patients and carers.
- d) involve patients in medication management and review.

### 5. Use patient feedback to drive change

- a) use patient feedback from a range of sources (surveys, focus groups, anonymous shoppers) to gauge service quality and inform all staff.
- b) review patient care experience metrics at each meeting as an indicator of quality.
- c) implement processes to provide real-time feedback to staff to enable patient issues to be addressed during care (eg 'patient friend' models and bedside electronic systems).

### 6. Focus on work environment

- a) regularly assess work culture and staff satisfaction.
- b) celebrate staff successes in a visible manner.

### 7. Build staff capacity

- a) implement organisation-wide training in patient-based values and associated communication skills techniques.
- b) involve patients and carers in staff education, including sharing stories of good and poor experiences of care.

### 8. Learning organisation culture

- a) enable staff to identify care delivery issues and solutions, focusing on addressing patient feedback.
- b) ensure processes are in place to enable ongoing patient and family engagement in open disclosure following adverse events.
- c) share the learnings from tragic events with staff to improve quality of care.

### 9. Accountability

- a) include accountability for patient care experience in all job descriptions and provide feedback in performance reviews.



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# PATIENT POWER



## AN EMPOWERED ACTIVATED PATIENT:



Understands their health condition and its effect on their body.

Feels able to participate in decision-making with their healthcare professionals

Feels able to make informed choices about treatment.

Understands the need to make necessary changes to their lifestyle for managing their condition.

Is able to challenge and ask questions of the healthcare professionals providing their care.

Takes responsibility for their health and actively seeks care only when necessary

Actively seeks out, evaluates and makes use of information.

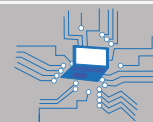
Source: European Network on Patient Empowerment (ENOPE) [www.enope.eu](http://www.enope.eu)

## “Nothing about me without me.”

Valerie Billingham, *Through the Patient's Eyes*, Salzburg Seminar Session 356, 1998

## TOP 5 TRAITS OF EMPOWERED PATIENTS

- 1** Responsibility: this includes collaborating with their healthcare providers to make decisions, researching treatment options, preparing for appointments and so on.
- 2** Use common sense: this includes making an assessment of what care is being recommended because it CAN be done vs what SHOULD be done, sticking up for themselves when necessary (eg asking the doctor if they have washed their hands before the examination)
- 3** Collaborative: reach decisions together with the healthcare professional.
- 4** Trust, but Verify: for example, questions the need for tests or imaging exams (Choosing Wisely), uses trusted online sources.
- 5** Use Technology to Gather Information



Source: Torey T (2013) The top 5 traits of empowered patients. About.com



## BENEFITS OF PATIENT ENGAGEMENT - 2011 SURVEY DATA FROM 11 COUNTRIES

The 11 Countries were Australia, Canada, France, Germany, New Zealand, Netherlands, Norway, Sweden, Switzerland, United Kingdom and United States

Quality of care in last year excellent or very good

69

42

Experienced medical errors in last two years

14

24

Believe that health system needs to be completely rebuilt

9

15

Engaged

Non Engaged

Source: Osborn R, Squires DMA (2012) International perspectives on patient engagement: results from the 2011 Commonwealth Fund Survey. *J Ambul Care Manage* 35(2): 118-28.

## 8 WAYS TO EMPOWER PATIENTS



- 1** Begin with empathy: openly acknowledge their emotional states, especially when they are difficult. Encourage patients to ask questions.
- 2** Knowledge is power – enable access to medical records, patient portals. Provide a list of trusted, authoritative online information portals.
- 3** Remind patients that they are at the centre of their own healthcare: coach them to be engaged consumers rather than passive recipients, and find power in the role. Arriving at appointments armed with information such as a list of all current medications, supplements, and regimens, as well as an up-to-date history of previous visits and procedures can help them feel in control.
- 4** Make shared decision-making the easy choice for clinicians
- 5** Groups of patients are a powerful asset
- 6** Listen to what patients have to say
- 7** Encourage patients to engage with social media: Find out what channels are available where you work and personally invite your patients to participate. Social media can also be a powerful way for patients to connect with others in similar situations.
- 8** Actively welcome and encourage patient empowerment: If you praise them for their efforts and actively listen to their opinions and concerns, you're likely to find them willing and enthusiastic partners in treatment going forward.

Sources: Drexel University (2014) 5 ways to empower your patients as a nurse. *Ragan's Health Care Communication News*, 21 July; Hillier M (2014) Five things the NHS must learn about empowering patients. *The Guardian*, 20 May. [www.theguardian.com](http://www.theguardian.com)





# HEALTH AND CLIMATE CHANGE

## IMPORTANT ROLE OF HOSPITALS AND HEALTH SECTOR



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### The Challenge of Our Times

Recent years have seen an increasing awareness that climate change is of dramatic importance not only for its impact on the environment, but also on human health. The last message has been launched by a relevant religious and moral leader: Pope Francis with his Encyclical "Laudato si" (Francis 2015).

Those who are working in healthcare, from policymakers to daily hospital operators, should be more aware that health facilities could be instrumental in the fight to reduce greenhouse gas (GHG) emissions.

In 2010, the Health and Environment Ministries of the EU met in Parma (Italy) at the 5th Ministerial Conference on Environment and Health and made a joint commitment to "increase the health sector's contribution to reducing greenhouse gas emissions and strengthen its leadership on energy and resource efficient management" (World Health Organization Regional Office for Europe 2010).

This article aims to highlight, based on several EU projects led by the authors namely-Renewable Energy Systems (RES)-Hospital ([www.res-hospitals.eu](http://www.res-hospitals.eu)), EcoQUIP: delivering efficiency, quality, and sustainability in healthcare ([www.ecoquip.eu](http://www.ecoquip.eu)) and Energy4Health (<http://www.ecoquip.eu/about-ecoquip/associated-projects.html>), that it is possible for hospitals to make a much greater contribution by taking a strategic approach to energy-related investment in energy efficiency and by stimulating sustainable innovation from the chain of goods and services of hospital suppliers.

### Why is Energy a Strategic Issue for Hospital Management?

Energy is definitely relevant for hospitals, which are institutions that work on a 24/7 basis 365 days of the year. They are clearly energy-intensive buildings but, due to their societal role, have not been exposed to the same scrutiny from the environmental lobbyists as the industrial sector. The stock of existing hospitals in the 28 EU Countries has been estimated at around 26,000 facilities (European Commission Joint Research

Centre Institute for Prospective Technological Studies, 2013), and the European healthcare system is responsible for about 5% of the total production of CO<sub>2</sub> emissions of the EU.

The efficient use of energy by hospitals and the type of energy they use can and should be considered as having great relevance not only for the contribution to "environmental health", but for enhancing their very mission to heal people. The question therefore remains: "why is such an important issue being ignored by healthcare managers and why do efforts not seem to achieve more relevant results?"

The project "Toward zero carbon hospitals with renewable energy systems" (RES-Hospitals) was designed with the specific goal of exploring the non-technical barriers to the exploitation of energy efficiency measures and renewable energy systems in hospitals and understanding how to tackle or at least minimise those obstacles ([www.res-hospitals.eu](http://www.res-hospitals.eu)). It was co-financed by the European Commission Executive Agency for Competitiveness and Innovation (EACI) (now Executive Agency for Small and Medium-sized Enterprises (EASME)) in the framework of the Intelligent Energy for Europe programme.

### The Need for a Multi-Faceted Approach

The initial action of RES-Hospitals was a survey, in 2011, among the hospitals' managers in the countries participating in the project: France, Holland, Hungary, Italy, Poland, Spain, UK (Scotland). It was aimed at understanding their perception and vision on the above-mentioned barriers.

The economic aspects and the related difficulties in getting financing for the investments ranked first, which was obvious, considering the financial crisis across the public sector in Europe. But was this the only reason?

Other interesting aspects emerged from the answers, shedding light on additional significant barriers.

- Hospital managers paid little attention to energy, due to its relatively low ranking in hospital costs, compared with staff

and medicinal expenditures;

- The matter was considered only a technical issue; it was not felt as part of their mission;
- New technologies were looked at with diffidence, considered not sufficiently tested;
- The supply chain was felt to be unprepared and unreliable in producing valid solutions.

Changing the perception of the health policymakers appeared, therefore, to be one of the important goals. Consequently selecting good practices and diffusing the most advanced approaches was one of the goals of the project that was realised with the publication of the Renewable Energy Guide for European Hospitals, which was widely disseminated through the website [www.res-hospitals.eu](http://www.res-hospitals.eu) and a number of workshops, conferences and congresses. Paper copies were also delivered to policymakers in the countries involved in the pilot studies.

Parallel work by organisations such as Health Care Without Harm (HCWH), published in scientific publications issued during recent years, has obviously contributed to widely diffusing the message. A Lancet report, arguing that tackling climate change could be the greatest global health opportunity of the 21st century, has given authoritative support in changing the way the matter is seen, at least by an important layer of policymakers and managers. The attitude of "energy is not my business" is, however, still the norm.

The need to increase managerial awareness that energy has become a strategic issue has to be conceived as a continuous process, that should focus on making clear and understood:

- The importance of the contribution that hospitals can make to the climate change challenge;
- The relevance of the matter of sustainability, even in economic terms;
- The importance of guaranteeing patient comfort with the control of energy efficiency;

- The trust in technological development and innovative solutions;
- The need for a proactive attitude with regard to the economic barriers, by researching and exploiting existing and new financial tools.

then explored to exploit deep geothermal resources to power not only at the hospitals but also some other local energy-intensive sites such as a zoo.

Two situations emerged that provided important lessons for existing European hospitals. One was the hospital Sant'Orsola of Bologna, which given its size and its urban location, at the present stage of technology development, does not have the possibility to produce on-site the necessary green energy. The procurement of biofuel and of green energy from outside the hospital will be essential and has to be associated with extensive measures for energy efficiency for its 31 pavilions constructed over four centuries.

The opposite situation is when hospitals have large areas available and a location favourable to green energy production. They could become producers of green energy even in excess of what would be needed to satisfy their own needs, and therefore, could generate much needed additional revenue to fund a better healthcare service.

In these situations especially, it becomes more economically feasible to consider

**Great Results are Possible on the Road Toward Hospitals with Zero Emissions**

The RES-Hospitals project conducted pilot studies in 18 hospitals across the seven EU Member States participating in the project: five in Spain, four in Italy, three in the Netherlands and Poland and one each in France, Hungary and the UK (the pilot studies are available on request from each partner) ([www.covenantofmayors.eu/actions/sustainable-energy-action-plans\\_en.html](http://www.covenantofmayors.eu/actions/sustainable-energy-action-plans_en.html)).

The goal of the pilot studies was to prove that it was possible, by the year 2020, for hospitals to produce 50% of energy consumption from renewable (green) energy onsite, including reduction of their energy consumption through efficiency measures.

The equally important objective has been

**“HOSPITAL MANAGERS PAID LITTLE ATTENTION TO ENERGY DUE TO ITS RELATIVELY LOW RANKING IN HOSPITAL COSTS”**

to focus on energy and matters normally considered technical such as the convergence of interest of the policymakers (contributing for financial aspects), the health sector (for the impact on patients), staff and patients (awareness of the importance of habits and behaviour).

The studies also considered how each of the hospitals could reach a zero carbon position sometime in the future and this started to open their minds to wider and more collaborative solutions including community energy systems and collaboration with other stakeholders.

To consider a few examples, the Spanish participants focused mostly on biomass to reach the target of 50% of renewable energy produced on site. The Italian participants have presented solutions utilising photovoltaic and thermal solar, supported in a couple of cases by additional biomasses.

In the Dutch case the possibility of the hospitals producing wind energy, both on and off-site, was considered, but the national incentives were less attractive than in some other countries. A more radical approach was

an alliance between the hospital and its community. This is, in fact, another area where there is need for more collaborative thinking by publicly-funded organisations. For example the Covenant of Mayors has so far paid very little attention to hospitals in their Sustainable Energy Action Plan (SEAPs).

RES-Hospitals concluded in November 2013, but the issues that were highlighted have been explored further in an EU-funded policy roadmap project (Energy4Health) during the past 18 months. The policy roadmap was launched in March 2015 and the authors hope to implement the conclusions through a Horizon 2020 project ([www.ecoquip.eu/about-ecoquip/associated-projects.html](http://www.ecoquip.eu/about-ecoquip/associated-projects.html)).

**The Hospital for a Cultural Change to Address the Big Societal Challenges**

As well as the Energy4Health policy roadmap project, the results of RES-Hospitals have also partly influenced the establishment of a joint thematic action group on energy within the wider EcoQUIP project, which is aimed at demonstrating how the approach



Hospital of Versilia (Lucca-Italy) - photovoltaic and efficiency



Girvan Community Hospital – Scotland (UK) – windmill and biomass-fuelled heating system

of Public Procurement of Innovation (PPI) can improve the efficiency, quality and sustainability of healthcare.

Through this project, some hospitals are adopting new approaches to achieve their strategic objectives through PPI. One of these is the Nottingham University NHS Trust in the UK, which launched a market-sounding proposal for novel solutions for its future energy needs that received a response from a wide variety of innovative businesses. The option currently being explored is a modular hydrogen fuel cell-powered combined heat and power (CHP) system.

Another important point is that hospitals also need to consider the embedded impact in their supply chain as well as their own activities. One way to do this is to use the Scope 1, 2 and 3 emissions approach in the internationally-recognised Greenhouse Gas Protocol accounting system ([www.ghgprotocol.org](http://www.ghgprotocol.org)) (see Image1).

**The Roadmap Toward Hospitals at Zero Emissions**

The Energy4Health project mentioned above was funded to support the EU Demand-Side Action Plan and was one of six projects aimed at 'Building and Implementing Strategic

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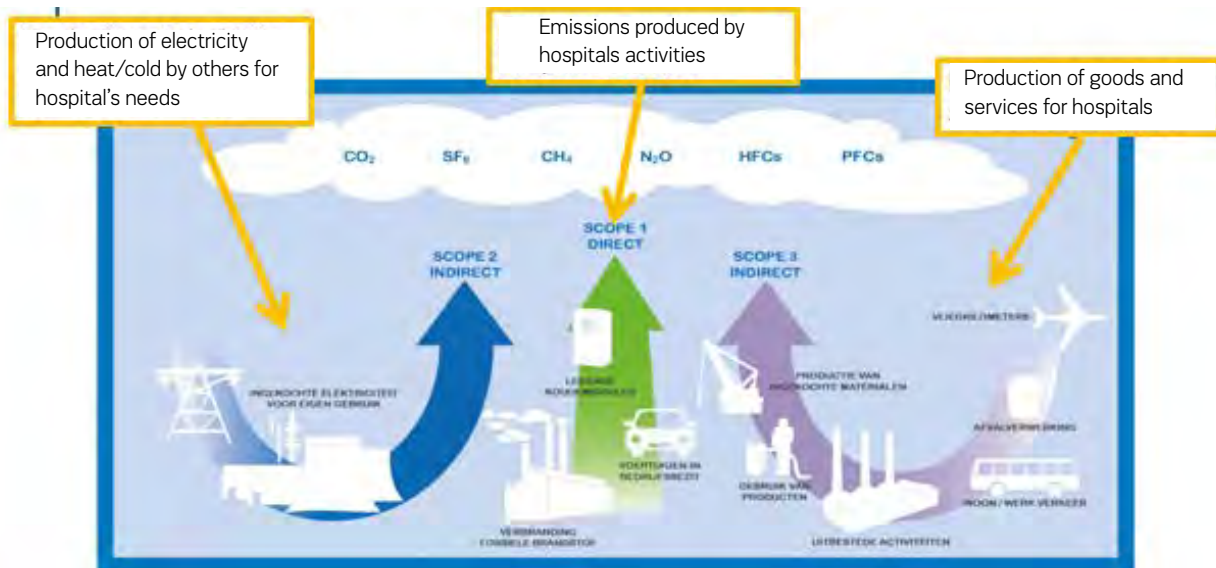


Image 1. Typical Representation of the Scope of Hospital-Related Greenhouse Emissions



Hospital Le Mollet – Barcelona – Spain – bio-architecture and geothermic

### Key Points

- ✓ Role of hospitals for the climate change challenge.
- ✓ Barriers.
- ✓ Need of new understanding of hospital policy makers and managers .
- ✓ New approach to energy issues for healthcare.
- ✓ Public procurement of innovation.
- ✓ Influence on reduction of embedded CO<sub>2</sub> for the supply chain.
- ✓ Roadmap for zero- emission hospitals.

Roadmaps of Demand-Side Policy Measures to Boost Demand for Industrial Innovation’.

The aim was to develop and secure stakeholder commitment for a strategic policy roadmap to improve the framework conditions that influence the demand for and market uptake of innovative solutions in the healthcare sector. It engaged with a broad spectrum of stakeholders.

The activity has led to eight operational objectives that comprise the Energy4Health roadmap:

1. Encouraging and facilitating the development of sector level National Energy Efficiency Action Plans and National Renewable Energy Action Plans;
2. Providing evidence of the scale of fossil fuel use in the European healthcare sector;
3. Improving knowledge exchange on sustainable energy management in the healthcare sector;
4. Raising awareness of alternative funding options for transformation of energy infrastructures;
5. Encouraging community and district level energy partnerships;
6. Raising awareness of the link between energy efficiency and patient wellbeing;
7. Developing a European benchmarking database of energy consumption and production;

8. Encouraging the sustainable energy technology sector to consider the healthcare sector as a lead market for new and improved solutions.

It is hoped that the Energy4Health Roadmap will be adopted by influential stakeholders both directly and through participation in a proposed Horizon 2020 implementation action to be known as E4H-PLUS.

### The Continuation of Action and Advancing Goals

The experience of the RES-Hospital and Energy4Health projects has provided clear evidence that hospitals and healthcare policymakers need to be more strategic about addressing the future energy and climate impact challenges of the sector. The E4HPLUS project will bring together influential stakeholders to assist the healthcare sector (public authorities) in the definition and implementation of sustainable energy policies and measures. The longer-term aim should be to reduce the negative impact to zero and to be more collaborative with both the municipalities and the energy technology innovators in realising such an aspiration. This should be based on common awareness on one hand that the fight for the environment is also “hospital business” and on the other hand that the hospital is not a “world apart”. ■

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# PERCEPTION VERSUS REALITY IN THE ERA OF THE ACA



**F**ear not! This is not another diatribe for or against the Affordable Care Act (Obamacare). This is intended to be a discussion about terminology of programmes/services in the ever-changing healthcare environment, and the intended meaning as opposed to the perceived meaning.

The 1980s brought us the Health Maintenance Organization, or HMO. This programme was developed by the insurance industry to rein in spiralling costs. It was doomed to failure due to multiple flaws. There was a lack of ability to gather and share clinical information; it was driven entirely to control costs, without apparent concern for quality or outcomes; and, most importantly, the perception by the consumer was that it restricted choice. It was this perception, rather than the actual problems with the system, that caused it to fail. As a result, the term HMO is perceived as a bad idea.

In the late 1990s a new acronym arrived, the ACO, or Accountable Care Organization. This concept was based on a clinically integrated group of providers caring for patients based on quality and efficiency metrics, and taking responsibility for care as well as cost. This is not entirely dissimilar from the HMO model, except that a few tweaks were made in the compensation plan, and the ability to share data was improving. The concept gained little traction until it was made a centrepiece of the ACA. The government developed demonstration projects to highlight the potential benefits of ACOs, and all of a sudden, everyone wanted to be an ACO! Since there were no specific requirements to call oneself an ACO, the term has lost meaning, however the perception is still positive and therefore, it is still a popular term to use.

Please notice that the term compensation was used, not reimbursement. Reimbursement suggests repayment of a loan, while compensation suggests payment for services or labour. In reality, payment determinations for health



services have created this “healthcare crisis”. Providers are paid “fee for service”, which means the more you do to someone, the more money you receive. No consideration is made for outcomes, appropriateness, or value. Hospitals are paid based on the number of admissions, not the health of their constituents. The payment system is entirely counterintuitive. Providers are paid to keep doing things TO patients, not for patients; and hospitals are paid to put people in the hospital, not keep them out, and healthy.

The most recent terminology to grace this discussion is Population Health Management. The concept is excellent

– using disease-specific guidelines to minimise complications and improve outcomes. However, the perception of the terminology is that we are treating populations, not individuals. Management suggests limiting choice. The public perception of the term is at odds with the intent of the concept. I propose we create new terminology that is descriptive of the intent: GLOBAL HEALTHCARE EXPERIENCE. If we use terminology that is clear and carries positive connotation, and we set guidelines and expectations for use of the terminology, our message will ring true and we can partner with the public to adapt to the changing climate and provide quality cost-effective care. ■



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# AERODYNAMIC LEADERSHIP

## DISCOVERING YOUR LEADERSHIP SHAPE



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### Understanding Aerodynamics

The word *aerodynamic* has many definitions. My favourite is my own personal amalgamation of over ten different definitions that I found online: “*The science of aerodynamics is the study of the resulting interactions between an object and air.*” There are most certainly more advanced definitions, but to those of us who are not aeronautical engineers, no definition that I have found is clearer.

In 2004 I had a metaphorical epiphany. I realised that effective leaders and aerodynamic objects were very similar. Many of the same mechanics at work in aerodynamic objects are also at work in effective leadership. Before we can understand aerodynamic leadership, we need to understand some of the basic principles of aerodynamics first. Firstly, what makes an object aerodynamic?

*Aerodynamic* objects are faster, more stable, and more efficient than counterdynamic objects, according to the National Aeronautics and Space Administration (NASA) (2013). They are **faster**, because their shape creates less drag. **More stable**, since all four forces of aerodynamics, thrust, weight, lift and drag, are maintained in an equal balance. And finally aerodynamic objects are **more efficient** because less drag results in less strain on an engine, thereby increasing the fuel efficiency of the object, according to the website *How Stuff Works* (George 2015).

*Aerodynamic* objects have at least two characteristics that counterdynamic objects do not. They have slender cross sections (meaning they are low to the ground and not very tall), and they possess narrow leading edges (meaning the edge of the object that first makes contact with the air or water is thin and narrow).

In contrast, counterdynamic objects have thick cross sections and wide, obstructive leading edges (see Figure 1).

### Laminar Flow vs. Turbulent Flow

Most importantly, aerodynamic objects produce laminar (streamline) flow (see Figure 2).

**Laminar flow** is characterised by the movement of air or fluid around or over an object in nearly straight lines, while **turbulent flow** is characterised by the movement of air or fluid around an object, resulting in choppy or chaotic flow (JYSCIENCE 2012). Figure 2 demonstrates that with laminar flow there is very little disruption to the airflow, because of the shape or the orientation of the object, while turbulent flow creates chaotic, choppy airflow due to the orientation of the object or the shape of its design (see Figure 3).

The importance of laminar flow and aerodynamic design became evident when the United States was embroiled in the energy

were passed along to semi-truck manufacturers. It is therefore no accident that modern day semi-trucks look more like the space shuttle than the giant, clumsy shoe boxes moving inefficiently down the highway (CNN Money 2011).

But a valid argument remains: semi-trucks are designed to haul huge amounts of cargo – they are not designed to travel fast. True, but every type of vehicle can benefit immensely from aerodynamic properties. The semi-truck pictured on p. 202 in Figure 4 is the Airflow BulletTruck.

The BulletTruck has completely smooth contours, no hard edges and panels along the underside of the truck that reduce drag caused by wind colliding with the tyres. In 2012, to put the BulletTruck’s aerodynamic properties to the test, the company made a cross-country trek from Connecticut to California. The BulletTruck, with a full payload, achieved an amazing 13.4 mpg compared with 4-6 mpg with ordinary semi-trucks (Chick 2014).

## “AERODYNAMIC LEADERS ARE MORE STABLE BECAUSE THEY UNDERSTAND THE IMMENSE VALUE OF CONSISTENCY”

crisis of the 1970s. President Richard Nixon requested help from all federal agencies in determining new energy solutions to ease the crisis. During this time, Daniel Lockney, a NASA engineer, who was working on the design of the top secret space shuttle, noticed that the semi-trucks that traverse the United States, consuming countless gallons of fuel, were not very aerodynamic. As an avid motorcyclist he was regularly jostled about, almost to the point of losing control of his bike, whenever a semi-truck passed him on the highway (a perfect example of turbulent flow – see Figure 3). Lockney decided to bring some of the aerodynamic concepts of the space shuttle concept to modern semi-truck designs. He received permission from President Nixon to take his team of engineers out to Edwards Air Force Base to create designs for a new, more efficient semi-truck. After his team completed their research the plans

### The Aerodynamic Leader

To begin to tie aerodynamics with effective leadership I ask one simple question: “As a leader, what is your leadership shape?”

**Aerodynamic leaders are faster, more efficient, and more stable.** *Aerodynamic* leaders are faster in that they accomplish tasks quicker. Employees get very frustrated when tasks go untended to by their leaders. Employees want movement on their problems and fast answers to their unresolved questions. *Aerodynamic* leaders work smarter and more efficiently. Regarding working hard, my father used to say to me that washing machines work hard. Working hard does not guarantee success. *Aerodynamic* leaders position themselves to function from their strengths. *Aerodynamic* leaders are more stable, because they understand the immense value of consistency. Above all other leadership traits, consistency is the key to leadership success.

**Note:** the word counterdynamic is not found in the dictionary. It is a word we developed specifically for the Aerodynamic Leadership lexicon. The available antonyms for the word “aerodynamic” are, I feel, inadequate (“inefficient” (Thesaurus.com 2015), “indirect” (Synonym.com 2015), since they only speak to one or two aspects of aerodynamic principles, so this word was developed in contrast to make this discussion more easily understood.



Figure 1.



Figure 3.  
Source: [http://money.cnn.com/galleries/2011/technology/1110/gallery.government\\_inventions/6.html](http://money.cnn.com/galleries/2011/technology/1110/gallery.government_inventions/6.html)  
Image credit (R): (c) Thinkstock

Employees almost always know what great leaders will do next.

**Aerodynamic leaders are faster, more efficient, and more stable, because they possess minimal cross sections, thin leading edges and professional characteristics that produce laminar flow.** Aerodynamic leaders have minimal cross sections that promote lift. Aeroplane wings, by design, promote lift. Consequently, aerodynamic leaders, by design, seek to elevate or lift those around them. Few things are more rewarding to an aerodynamic leader than watching the success of a member of their team. Aerodynamic leaders have thin leading edges meaning they do not have to be the centre of attention. Their employees, like air across an aerodynamic

shape, flow easily around them. Their presence, while firm, promotes easy interactions. Aerodynamic leaders create laminar flow by possessing vision. Their decisions are well thought out, well timed, and produce results that are easily appreciated by their organisation. Aerodynamic leaders craft important organisational decisions from a leadership perspective, but implement those decisions from an employee perspective.

**The Counterdynamic Leader**

**In contrast to aerodynamic leaders, counterdynamic leaders are slower, less efficient, and less stable.** Counterdynamic leaders are slower, because they function at a pace that hinders confidence.

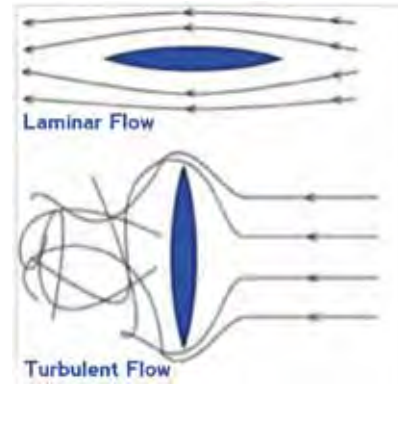


Figure 2.  
Source: <http://jyscience.wordpress.com/>

When tasks that normally take one day to complete start to take one week to complete, staff begin to lose confidence in their leader. Counterdynamic leaders are less efficient, because they often focus on the quantity of work instead of the quality of work. Being a results-oriented leader is a far harder task than just working long hours. Being responsible for outcomes is much more difficult than requiring constant activity. Counterdynamic leaders are less stable, because they often prefer operational and administrative prerogatives. Executive privilege can be important to successful leadership, but only on rare occasions. Staff need to see that their leader can follow his/her own rules as regularly as they are asked to.

**Counterdynamic leaders are slower, less efficient and less stable, because they possess tall cross sections, thick, obstructive leading edges, and professional characteristics that create turbulent flow.** Counterdynamic leaders have tall cross sections that promote drag. Their leadership style asks the question, "What advantages can my title or authority offer me?" instead of "What advantages can my title or authority offer my staff?" Counterdynamic leaders possess thick, obstructive leading edges that manifest in a need for their employees' attention or approval. Interactions with counterdynamic leaders are more focused on themselves than on their employees. It is important to remember that it takes much more energy for an employee to approach a leader, than for a leader to approach an employee. Finally, counterdynamic leaders promote turbulent flow, because they are often not prepared. Counterdynamic leaders often shoot from the hip or try to use their charisma, personality or experience to solve problems or produce change.



Because they are not thoroughly prepared, they often stumble or fail, producing a lack of respect in their employees that further produces a type of organisational turbulent flow.

Knowing what *aerodynamic* and counterdynamic leaders look like, how can we function more like an *aerodynamic* leader? What principles can we follow that can help us to function more aerodynamically?

*Aerodynamic* leaders, conveniently, are metaphorically similar to a wise and seasoned airline pilot. With that understanding, here are five *aerodynamic* leadership principles to get you started in the right direction.



**Figure 4.**  
Source: [http://www.airflowtruck.com/Press\\_Releases.html](http://www.airflowtruck.com/Press_Releases.html)

### Key Points

- ✓ The science of aerodynamics is the study of the resulting interactions between an object and air.
- ✓ Many of the same mechanics at work in aerodynamic objects are also at work in effective leadership.
- ✓ *Aerodynamic* leaders are faster, more efficient and more stable.
- ✓ In contrast to *aerodynamic* leaders, counterdynamic leaders are slower, less efficient, and less stable.
- ✓ *Aerodynamic* leaders are faster, more efficient and more stable, because they possess minimal cross sections, thin leading edges and professional characteristics that produce laminar flow.
- ✓ Counterdynamic leaders are slower, less efficient and less stable, because they possess tall cross sections, thick, obstructive leading edges, and professional characteristics that create turbulent flow.

### Aerodynamic Leadership Principles

**Aerodynamic Leadership principle #1:**  
*Your passengers (the members of your organisation) cannot see what you see or hear what you hear.*

*Aerodynamic* leaders should remember that they are the only ones in their organisation with a direct view ahead. Because of the position of their passengers they cannot see what is happening. Their vision is limited to the periphery while their primary view ahead is obstructed. This is very important to remember – your people, who are your customers, depend on you to compensate for their lack of vision. Additionally, your team members will not hear what you hear either. When the tower calls to redirect your flight, your passengers are not privy to that conversation. *Aerodynamic* leaders will communicate just enough to bring understanding.

**Aerodynamic Leadership principle #2:**  
*Be informative early*

If your organisation must climb to avoid a storm or divert to a different destination due to mechanical issues, it is best known earlier than later. People are naturally controlling, which means that they are especially sensitive when they have no control. *Your people need to feel that their pilot is in control so that their personal lack of control is under control.* Communicating change with a good amount of lead time makes for a more rational and prepared group of passengers.

**Aerodynamic Leadership principle #3:**  
*Be economical in your speech*

One of two things happens when someone uses too many words, but does not arrive at a conclusion: the hearer either tunes them out, or watches and waits for the speaker to crash and burn. When a pilot cannot get to the point quickly it makes his passengers very, very nervous. Pilots who explain themselves confidently are respected – pilots who explain themselves confidently and *economically* are *aerodynamic*!

**Aerodynamic Leadership principle #4:**  
*Know what your flight attendants know*

Flight attendants are found among the passengers, not locked away in the cockpit, therefore they see what the pilot cannot. Flight attendants can best describe the mood of the passengers, see potential problems brewing, and are ideally positioned to improve their passengers' flight experience. *Aerodynamic* leaders know what their flight attendants know, and as a result they know what is going on in their aircraft.

**Aerodynamic Leadership principle #5:**  
*Avoid actions that hinder your aerodynamic ability*

An *aerodynamic* leader would never drop their flaps or landing gear at an altitude of 50,000 feet while travelling at over 500 mph. It would greatly disrupt the aerodynamic ability of the aircraft and imperil the passengers, but inappropriate words or actions by a leader effectively do the same thing. I have witnessed profanity-laced tirades by unhinged leaders aimed directly at their employees. I have stood by while a leader that I respected made devastatingly inaccurate statements simply because he did not do the necessary prep work to comment. Unfortunately, inappropriate words or actions of someone in leadership, almost always adversely affects the ones they lead.

### Conclusion

After reading this article, a healthy exercise might be to ask the following questions:

- Are my leadership decisions aerodynamic or counterdynamic?
- Do my employees perceive me to be an *aerodynamic* vehicle or a counterdynamic vehicle?
- Do my employee satisfaction scores reflect an *aerodynamic* leader or a counterdynamic leader? Does my leadership create streamline flow or choppy, chaotic flow?

Whatever your current leadership shape is you now possess the knowledge to evaluate that shape and improve the aerodynamics of it! ■

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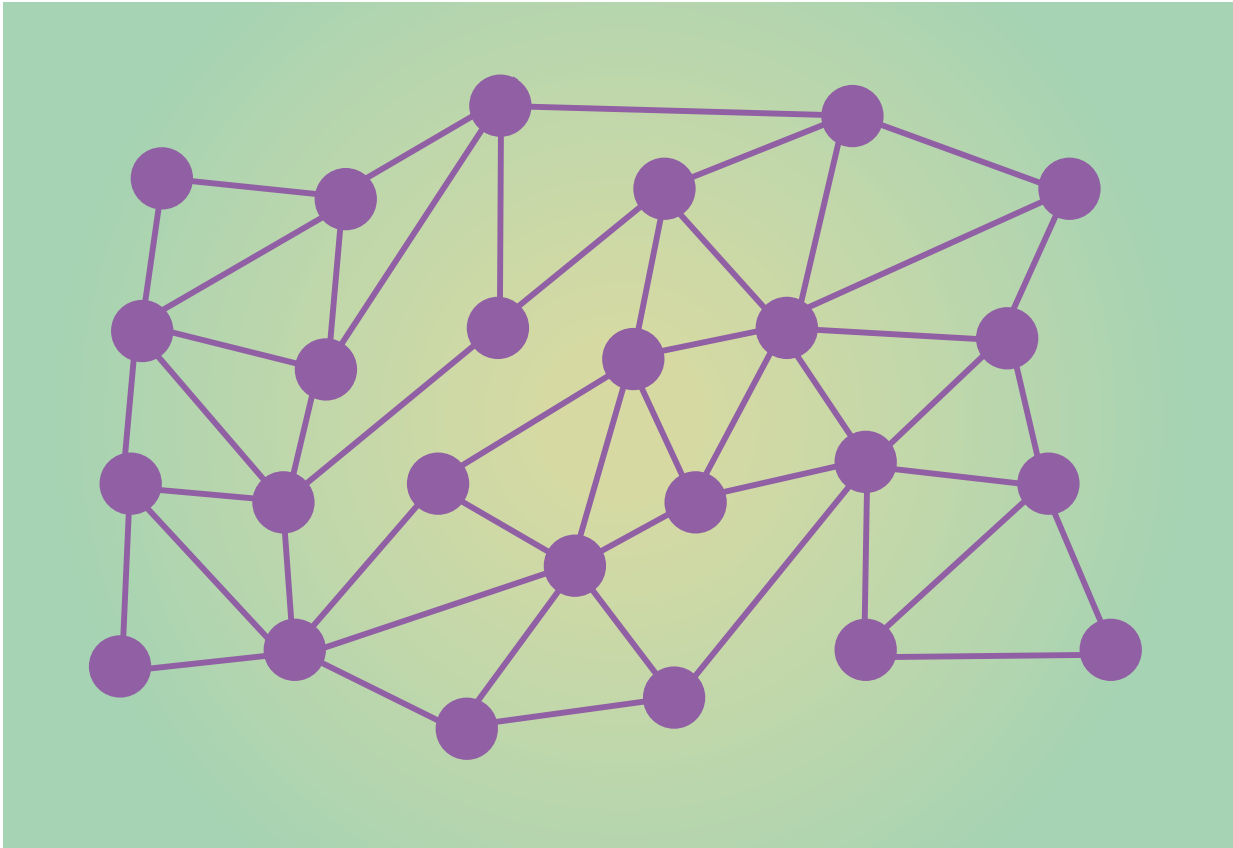
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# THE CHALLENGES OF INTEGRATION

“Buzzwords abound in healthcare. The latest, ‘Integration’, will only be achieved by effective collaboration across all boundaries; ‘partnership working’, ‘joint working’ and ‘joined-up thinking’ we have heard so much about for so long,” says Shirley Cramer, CEO of the Institute of Healthcare Management (IHM).



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Integration has been an overt policy goal of governments over the last two decades. We are told that it holds the promise to deliver real change. It will meet the growing need for long-term support resulting from changing demographics, shift from a hospital-based medical model to a social approach that keeps people in the community and maintains wellbeing, address so-called bed-blocking and save money - not necessarily in that order.

Prior to the May 2015 General Election in the UK, it was clear that the concept of integration had renewed its grip on the imagination of the politicians. Amid claims

and counter-claims about in which party's hands the National Health Service (NHS) was safest, there was at least consensus that health and social care integration was the way forward.

In this area England lags behind Northern Ireland, which has 45 years of experience of an integrated system, and the other regions of the UK also have a way to go to catch up. The Welsh Government introduced an Intermediate Care Fund in December 2013 to drive forward integration between health, social care, housing and the voluntary sector, while Scotland's Public Bodies (Joint Working) (Scotland)

Act, which introduced a requirement on NHS Boards and Local Authorities to integrate health and social care, was granted royal assent on April 1, 2014.

But England is also forging ahead with plans to make integration a reality. The 5.3 billion pounds Better Care Fund (formerly the Integration Transformation Fund) was announced in the June 2013 spending round with the aim of creating “a local single pooled budget to incentivise the NHS and local government to work more closely together around people, placing their well-being as the focus of health and care services” (NHS England 2015).

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In November 2013, 14 Integrated Care Pioneers were selected to demonstrate the use of ambitious and innovative approaches to deliver person-centred, coordinated care and support. Learning, we are promised, will be shared.

Meanwhile, no discussion of integration would be complete without mention of the announcement in February this year of Greater Manchester and NHS England's plans to bring together decision-making on health and social care, combining total budgets of 6 billion pounds. The move saw NHS England, 12 NHS Clinical Commissioning Groups, 15 NHS providers and 10 local authorities agree on an integration framework for health and social care, designed to support and improve the population's physical, mental and social wellbeing.

So the holy grail of integrated care is being hotly pursued, despite its many challenges and evidence that it doesn't always achieve what it sets out to do. In an article in *The Guardian* (Bamford 2015a), Terry Bamford, author of *A Contemporary History of Social Work* (Bamford 2015b) notes that in Northern Ireland integration has failed to address a reliance on hospitals and institutional care, which is significantly greater than elsewhere in the UK. A model based on community-based services, he says, "remains an aspiration".

Looking ahead, he adds that there are important lessons to be learned: "Structural integration, as in Northern Ireland or the short-lived experiment in England with care trusts, will not in itself deliver the change. Instead it diverts managerial attention to organisational change rather than developing collaborative working."

### The Challenges of Collaboration

Yet collaboration is not always simple to achieve. In his Centre for Health and Public Interest 2013 paper *Competition and*

*Collaboration in the new NHS*, Professor Bob Hudson, Visiting Professor in Public Policy at the University of Durham, described partnership working as "a delicate plant based upon shared vision and high-trust relationships". In coming years, he predicts that we may witness "at best" guerrilla warfare as public sector commissioners and providers seek ways of working together more closely "in the face of legislation and regulations that pull in the opposite direction" (Hudson 2013).

Whether or not this prediction comes true remains to be seen, but it is difficult to see that anything other than closer collaborative working between providers and commissioners can deliver the dream of integrated health and social care. For the hard-pressed NHS – and in the best interests of patients – IHM would argue that this has never been more important.

In a 2007 literature review, *Working in Collaboration: Learning from Theory and Practice* (Williams and Sullivan 2007), the National Leadership and Innovation Agency for Health Care in Wales noted that the effectiveness of collaboration and partnerships as ways of managing and delivering public policy had been questioned in academic texts (eg, Sullivan and Skelcher 2002), in officially sponsored evaluation studies (eg, Williams et al. 2006), and by practitioners and managers on the ground.

A range of problems associated with making collaboration and partnerships "work" were identified. These included: leadership styles, multiple accountabilities, governance, cultural and professional differences, power disparities, differing performance management arrangements, institutional disincentives, historical and ideological barriers, resource problems and converting strategic intent into effective implementation.

The hurdles identified are not insurmountable, but clearly collaboration is not achieved simply by a belief in its virtues. In its report, *Hospital Collaboration in the NHS: Exposing the myths* (Fenton and Custance 2015), KMPG offered eight pointers to successful collaboration that could be applied in and across all health and social care organisations:

- Design the solution to match the problem - the form of collaboration should match the goals and challenges of the institutions involved and the needs of the local health economy;
- Prioritise sustainability over short-term financial aims;
- Ensure that both parties have something to gain;
- Remember it's all about the patient;
- Engage and communicate with staff;
- Don't underestimate the importance of culture - leaders need to understand cultural similarities and differences in order to address divisive sensitivities and hence ways to suit all parties;
- Standardise and codify good practice;
- Align payments and incentives.

In an environment that is increasingly made of markets and subject to competition, there is a risk that silo working may become a default position. In his book *Silos, Politics and Turf Wars* (2008), Patrick Lencioni warns: "Silos – and the turf wars they enable – devastate organisations. They waste resources, kill productivity, and jeopardise the achievement of goals." IHM believes that a culture of collaboration should be encouraged across all health-care boundaries. It may not be an antidote to every healthcare policy problem, but successful health and social care integration is impossible without it. ■



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# QUALITY AND SAFETY IN RADIOLOGY

## A SYMBIOTIC RELATIONSHIP



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### Political Background

Safety and quality have been highlighted by the European Commission's Directorate-General for Health and Food Safety (European Commission Expert Panel on Effective Ways of Investing in Health Expert Panel 2014). The Expert Panel on Effective Ways of Investing in Health was tasked with considering the core dimensions of quality of healthcare, including patient safety.

The Expert Panel listed the dimensions of safety and related goals:

- Development of safety systems (including authorities, bodies, culture of patient safety, standards/guidelines) and strategies (policies, programmes);
- Development of patient safety information and learning systems;
- Education and training of healthcare workers, management and administrative staff;
- Encouragement of multidisciplinary patient safety on-the-job education and training;
- Empowering and informing citizens and patients, including patient involvement in safety policies.

The Panel noted that the most frequently used dimensions of quality of care include safety. However, these dimensions are not mutually exclusive and cannot be considered comprehensive (see Table 1).

The European Society of Radiology's *Call for a European Action Plan for Medical Imaging to Improve Quality of Care and Patient Safety* (ESR 2014) was launched in November 2014 to target policy-makers to strengthen harmonisation efforts in regard to quality and safety, education and training, as well as research and technology, in order to significantly improve European healthcare systems and ensure better quality

and safety for European patients.

To progress harmonisation of safety in imaging across Europe, the ESR calls on the EU institutions to:

- Support the establishment of European quality and safety indicators for imaging;
- Support an audit of imaging equipment, doses, image quality and procedures of the medical imaging chain in Europe, and to develop plans to modernise equipment;
- Support efforts to improve communication with patients;
- Improve inter-institutional cooperation for more coherent action in the area of health;
- Support the EuroSafe Imaging campaign ([eurosafeimaging.org](http://eurosafeimaging.org)) to raise awareness of the importance of radiation protection.

### The Concept

Quality healthcare by definition means safe healthcare, and safety should be managed as an integral part of quality assurance. Safety, as defined by the National Patient Safety Foundation, is "the degree to which health care processes avoid, prevent, and ameliorate adverse outcomes or injuries that stem from the processes of health care itself" (National Patient Safety Foundation 2000). The Institute of Medicine defines it as freedom from accidental injury due to medical care or medical errors (Institute of Medicine 1999).

The EuroSafe Imaging initiative ([eurosafeimaging.org](http://eurosafeimaging.org)) was set up in 2014 to promote quality and safety in medical imaging. The twin roles of quality and safety are summed up in Figure 1, showing that a process-oriented and patient-centred approach is integral to medical imaging quality and safety.

The International Atomic Energy Agency (IAEA) issued its draft safety guide *Radiation Protection Safety in*

*Medical Uses of Ionizing Radiation* in November 2014 (International Atomic Energy Agency 2014) for comments by member states due by the end of April 2015.

### Patient Information on Radiation Safety

To promote patient understanding of radiation risk, health professionals need to establish confidence with the patient, emphasise that potential risks are an estimation and not actual, use the concept of benefit instead of risk and explain the quality of the practice and the equipment.

Together with the ESR Patient Advisory Group (ESR-PAG), EuroSafe Imaging will be working on patient information on radiation risks to add to its website, and will provide benchmarking tools through dose surveys.

The American College of Radiology (ACR)'s and the Radiological Society of North America (RSNA)'s public information website [radiologyinfo.org](http://radiologyinfo.org) includes a section on patient safety, with information on radiology benefits and risks, radiation dose in x-ray and CT exams, and a printable medical imaging record card that patients can use to record their medical imaging history. In addition, the ACR has published a *Position Statement on Quality Control and Improvement, Safety, Infection Control, and Patient Education* (American College of Radiology 1998).

The University of California, San Francisco's (UCSF) radiology department is an example of a well-developed radiation safety programme ([radiology.ucsf.edu/patient-care/patient-safety](http://radiology.ucsf.edu/patient-care/patient-safety)) that includes an experienced faculty member who devotes much of their time to patient safety. The department's website includes guidelines for use of CT and MRI during pregnancy and lactation as well as MRI and contrast guidelines.

	Donabedian (1988)	Maxwell (1992)	Department of Health (UK) (1997)	Council of Europe (1998)	IoM (2001)	JCAHO (2006)
Effectiveness	X	X	X	X	X	X
Efficiency	X	X	X	X	X	X
Access	X	X	X	X	X	X
Safety	X	X	X	X	X	X
Equity	X	X	(X)	X	X	X
Appropriateness	X	X	X	X	X	X
Timeliness		X	X	X	X	X
Accountability		X	X	X	X	X
Responsiveness		Respect Choice Information			Respect Patient centredness	
Satisfaction			(X)	X		
Health Improvement	X		X			
Continuity					X	
Other		Technical competence Relevance		Efficacy		Availability Prevention/early detection

**Table 1. Dimensions of Quality of Care**

Source: Expert Panel on Effective Ways of Investing in Health (2014)



**Figure 1. Relationship between Quality and Safety**

They list ten ways to ensure imaging safety:

1. Choosing the most appropriate imaging study;
2. Tailored techniques;
3. Careful quality control;
4. Latest CT technology;
5. Special attention for paediatric patients;
6. New low-dose CT protocols;
7. Shielding;
8. Beam collimation policy;
9. Appropriate training;
10. Radiation oversight committee.

**Clinical Audit**

Under Directive 97/43 Euratom and its successor Directive 2013/59 Euratom, applicable from 2018 (Council Directive 2013), clinical audit on radiation safety is mandatory. The European Society of Radiology’s (ESR) Audit and Standards Subcommittee has therefore launched Level I (basic) audit templates in 2015, which address essential patient safety standards, and is preparing the Level II templates for release in 2016 (see Table 2).

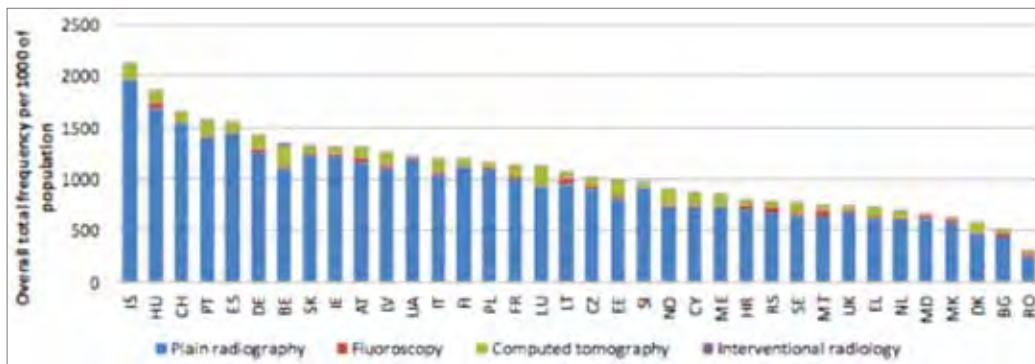
Authority of Requestor Policy	S Q
Authority of Requestor Policy Implementation	S Q
Justification Policy	
Justification Policy Implementation	
Justification Policy for women of child bearing age	S Q
Reliable System of recording the pregnancy status in examinations involving ionising radiation	S Q
CT Radiation Dose Records	S Q
Radiation Dose in Head CT in Children	S Q
Dose Optimisation in CT policy	
Implementation of Dose Optimisation in CT policy	
Policy for Patient Identification prior to procedure	
Implementation of Policy for Patient Identification prior to procedure	
MRI Patient Safety Check	S
Prevention of MRI Hazards Policy	S Q
Implementation of Prevention of MRI Hazards Policy	
Process for Consent for Interventional radiology procedures of non-emergency patients	S Q
Reduction of the Risk of Hypersensitivity reactions to contrast media	S Q
Policy on the Prevention of contrast-induced nephropathy (CIN)	S Q
Implementation of Policy on the Prevention of contrast-induced nephropathy (CIN)	
Appropriate Care of acute contrast media reactions	S Q
Resuscitation Policy/Training	
Infection Control Policy	S Q
Implementation of Infection Control Policy by Staff	
Compliance of Facilities with Infection Control Policy	
Policy on Communication of Emergency and Unexpected findings	S Q
Implementation of Policy on communication of emergency and unexpected findings	S Q

**Table 2. Level I (Basic) Audit Templates Prepared by the ESR Audit and Standards Subcommittee**  
S: safety - Q: quality

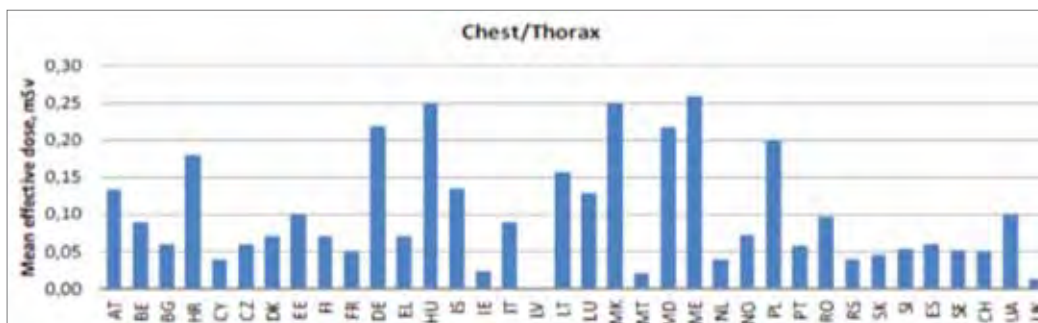


RADIOLOGIC STUDY	WRONG EVENT				NUMBER OF WRONG EVENTS	PERCENTAGE OF WRONG EVENTS
	Wrong Patient	Wrong Procedure	Wrong Side	Wrong Site		
Radiography	93	104	75	24	296	45.4%
Computed tomography	36	69	4	6	115	17.6
Mammography	7	87	4	0	98	15.0
Magnetic resonance imaging	7	27	5	0	39	6.0
Ultrasound	13	13	6	3	35	5.4
Nuclear medicine	4	8	0	1	13	2.0
Interventional	3	3	0	0	6	0.9
Dexa scan	1	1	0	0	2	0.3
Positron emission tomography	1	0	0	0	1	0.2
Not specified	31	14	2	0	47	7.2
<b>Total Number of Events</b>	<b>196</b>	<b>326</b>	<b>96</b>	<b>34</b>	<b>652</b>	
<b>Total Percentage of Events</b>	<b>30.1%</b>	<b>50.0</b>	<b>14.7</b>	<b>5.2</b>		<b>100</b>

**Table 3.** Wrong events by radiologic study reported to the Pennsylvania Patient Safety Authority, 2009  
Source: Pennsylvania Patient Safety Authority 2011



**Figure 2.** Example of Heterogeneity of Practice  
Source: European Commission Directorate General for Energy (2014)



**Figure 3.** Variation of the Effective Dose for Chest X-Ray across Europe  
Source: European Commission Directorate General for Energy 2014

### Safety: Registries, Reporting

In Pennsylvania there is a good example of safety reporting in a 2009 study that showed the following types of errors: (see Table 3)

Errors do happen in the radiology department, with failure to correctly identify patients leading to recognised wrong events, the potential for treating the wrong patient, doing the wrong procedure on the wrong side or the wrong site.

The main errors are:

- Wrong examination;
- Wrong patient;
- Wrong side;
- Wrong site;
- Wrong contrast agent;
- MR safety;
- Wrong protocol;
- Pregnancy (technician/radiologist not aware that patient is pregnant).

Such errors are caused by incorrect order or requisition entry, failure to confirm patient identity, failure to follow site and procedure verification or procedure qualification processes. Such errors can be prevented with clear procedures on MRI safety, identifying pregnancy and contrast agent procedures for iodinated agents and gadolinium chelates use.

Brook et al. (2010) found that poor communication, whether it was verbal communication or IT-related, caused many errors. Others have highlighted communication as the root of errors, for example:

- **“Poor communication** is at the heart of many medical errors.” (Woolf et al. 2004).
- Communication failures that contribute to discontinuity of care stem from a variety of causes, ranging from a lack of **interpersonal communication** skills to barriers in the work environment to **suboptimal use of computer networking tools.**” (Scott 2007).

Radiology departments should establish an events registry. One model is perhaps the U.S. Agency for Healthcare Research and Quality’s Patient Safety Indicators (PSIs) (n.d.) that provide information on potential in-hospital complications and adverse events following surgeries, procedures and childbirth. Another example

is the Radiology Events Register, an Australian initiative (Mandel 2015). In Europe, imaging and quality safety indicators are being developed by the ESR with the goal of allowing standardised reporting and to aid safety improvement.

**Clinically Justified Examinations**

Doing clinically justified examinations is certainly a major pillar of safety. For example, the number of examinations per 1000 of population clearly shows a high discrepancy between countries (see Figure 2), indicating in some situations either overuse or underuse, both being unsafe practices. In this context, monitoring of clinical indications should be helpful for finding a good compromise. The launch of ESR iGuide, a clinical decision support system for European imaging referral guidelines, is intended to support the justification principle by providing electronic decision support to referring doctors ordering imaging tests.

The recently published study by Ip et al. (2015) found wide variations also in the United States, and identified potential targets for future imaging quality improvement initiatives, including head CT and lumbar spine MR imaging.

Furthermore, it is well known that radiation dose differs between technicians, radiologists, within departments and across countries even for a very simple examination like chest x-ray (see Figure 3).

The establishment of standardised protocols and dose monitoring appears

to be essential in this context.

**Patients’ and Professionals’ Awareness**

Surprisingly, there is still little awareness of radiation risk from imaging procedures among healthcare professionals. Ramanathan and Ryan (2015) surveyed 92 residents, fellows, technologists and radiologists in a hospital group, and found that knowledge of radiation dose and risk is poor among all radiology workers. They found that for effective dose and for cancer risk in particular, the stated opinions of people working in imaging departments do not correctly reflect actual effective doses and cancer risk. (see Figure 4)

Although this is a Canadian study, we cannot assume that awareness amongst health professionals is any better in Europe. There is a lot to be done in education, which is why EuroSafe Imaging provides e-learning materials and radiation protection sessions for health professionals. Action 8 of EuroSafe Imaging’s 12-point action plan is to develop a data collection project called “Is your Imaging EuroSafe?” and an educational project on guidelines entitled “Are you imaging appropriately?”.

The aims are to build a European repository based on dose exposures for specific clinical indications that would be most helpful for self-benchmarking and for future establishment of diagnostic reference levels (DRLs), to provide insights into how the age of the equipment affects dose exposure, and also to create a tool for

communication with patients.

**Data is being collected on the following CT procedures:**

- CT head: acute stroke
- CT chest: pulmonary embolus
- CT head: acute head trauma
- CT chest: rule out pulmonary metastases of extrathoracic cancer
- CT chest: HRCT for diffuse parenchymal disease
- CT abdomen: liver metastases
- CT abdomen: urinary calculus
- CT abdomen: appendicitis
- CT Colonography
- Cardiac CT: Calcium coronary scoring

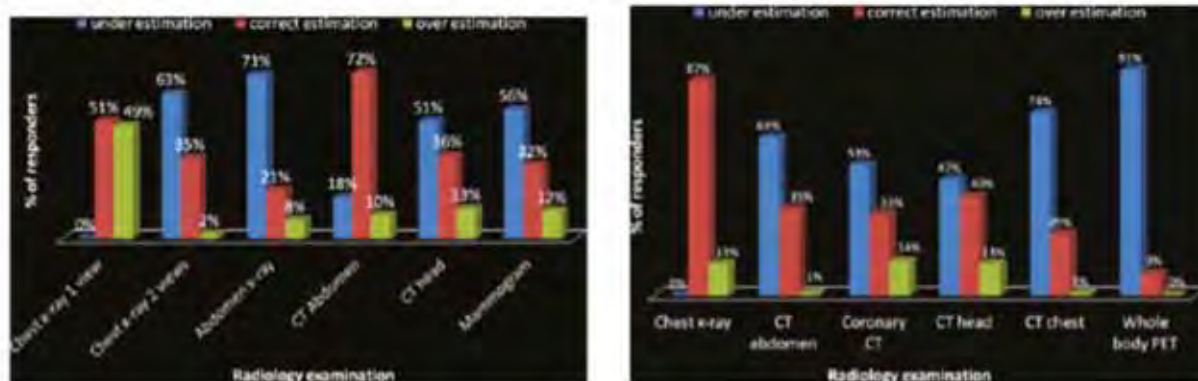
Preliminary results from the first survey on CT were presented at the European Congress of Radiology in March 2015 (see Figures 5, 6 and 7).

Even for this very simple examination 25% of doses reported are in the red circle, 25% in the green, and 50% in the middle. That means that even for simple examinations practice is very heterogeneous.

**European Regulations**

The European framework for quality and safety in imaging consists of the Euratom directive of 2013 (applicable from 2018) (Council Directive 2014), which outlines the principles of justification, optimisation, diagnostic reference levels, quality control, clinical audit and workers’ safety for x-ray imaging.

Safety guidelines for MRI are in preparation by the European Commission, in



**Figure 4.** Radiation Risk Awareness  
 Percentage of participants who underestimated and overestimated effective dosage equivalents of different radiology examinations (shown left), and the level of cancer risk from different radiology examinations (shown right)  
 Source: Ramanathan and Ryan (2015)

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**Preliminary Results**

(Status: 27 January 2015. As the survey is still open, the data displayed is preliminary.)

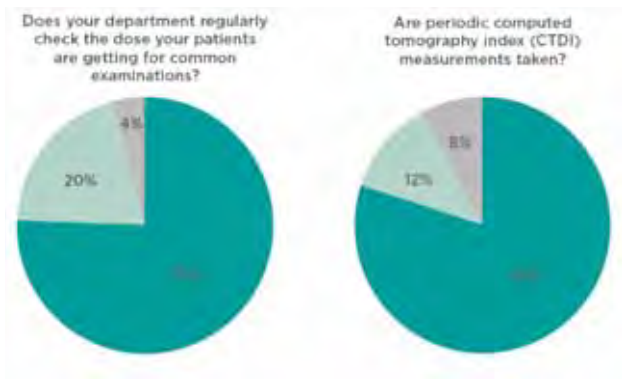


Figure 5. Head CT for Acute Stroke: Preliminary Results

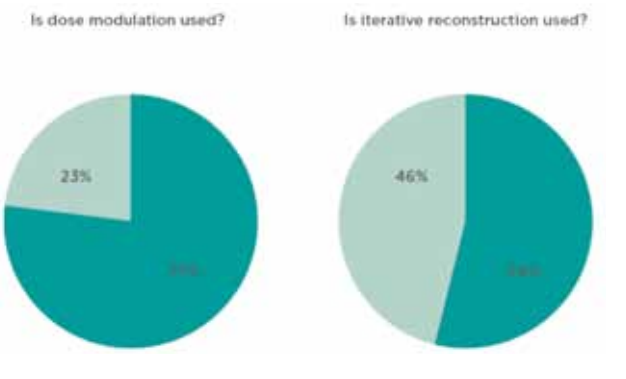


Figure 6. Head CT for Acute Stroke: Preliminary Results

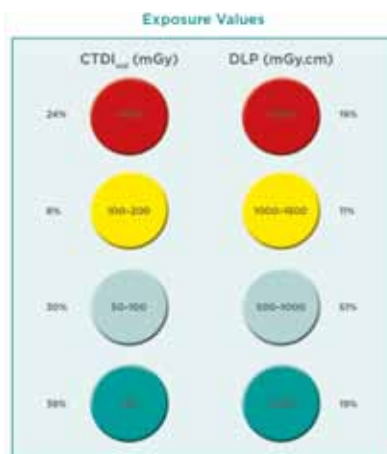


Figure 7. Head CT Practice: Preliminary Results

association with different stakeholders including radiologists, and will mainly cover workers' safety. The European Medicines Agency has updated its guidelines for contrast agents used in imaging procedures (European Medicines Agency Committee for Medicinal Products for Human Use 2008).

**Conclusion**

The safe use of imaging should remain the main goal. However, quality of practice, organisation and management are absolutely essential for ensuring patient safety, which also implies a need for access to adequate IT tools. Benchmarking, clinical audit and patient information are also essential in this context and should be developed. Involvement of all stakeholders is crucial. ■

**Note**

'Is your Imaging EuroSafe?' comprises a series of monthly surveys on CT DRLs for different indications - [www.eurosafeimaging.org/survey](http://www.eurosafeimaging.org/survey)

**Key Points**

- ✓ Consensus exists on the quality and safety concept;
- ✓ Safety procedures and patient information on radiation risk are integral to quality;
- ✓ Safety is sustained and structured by a strong internal policy on quality;
- ✓ Rely on and comply with EU regulation.



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# THE FUTURE OF PATIENT DOSE MONITORING IS MEDSQUARE'S RDM

Medsquare is one of the first European companies to introduce the DACS\* concept and develop a Patient Dose Management solution.

In a European context in which the demand for medical imaging examinations is constantly growing and safety and quality in radiological practice are more important than ever, our Radiation Dose Monitor software – RDM – helps healthcare organizations optimize radiation dose and clinical practices.

## RADIATION DOSE MONITOR

The DACS for **Building a Low-Dose Culture**

RDM is a software solution for collecting, controlling and analyzing radiation doses delivered to patients during medical imaging examinations. RDM helps improve clinical practices and is an essential tool for reducing and optimizing dose.

### 4 steps to optimize patient dose exposure with RDM

- 1. Collect:** Collection and archiving of dose data.
- 2. Control:** Real-time monitoring of the patient's dose exposure. Alert systems triggered when the dose is exceeded.
- 3. Analyze:** Wide Statistical analysis of dose data.
- 4. Optimize:** Assessment and optimization of practices.

#### Testimonial

*"Its user-friendly interface allows you to track, and enhance the reliability of, radiation dose exposure data in order to establish targeted corrective actions, as necessary. This software helps bridge the gap between all correspondents in patient radiation safety, in order to optimize dose."*

**Cécile Salvat, Medical Physicist from Lariboisière University Hospital (AP-HP), France.**

### What makes RDM unique?

A very efficient tool, RDM is designed for all medical professionals involved in the dose cycle: medical physicists, technologists, radiologists, heads of department, etc.

RDM is a vendor-neutral & multi-modality software solution. It's the only software able to integrate with very old equipment and collect dose information in a variety of methods: RDSR, Secondary Capture, MPPS, DICOM Headers, external dosimeter and manual input.

With regard to a hospital's infrastructure, RDM fits seamlessly into all imaging networks.

#### Testimonial

*"The integration of RDM in our IT infrastructure was accomplished simply and according to strategic deadlines. Today, via a user-friendly interface, we have a simple way of monitoring and preventing possible over-exposures. The traceability of dose received by our patients has been simplified, and the dose reports inserted into the patient file provide an accurate record."*

**Gyslaine Bruneton (IT Hospital Engineer) & Alain Fuchs (Medical Physicist) from Nice University Hospital, France.**



### About Medsquare

Medsquare provides innovative solutions for the medical imaging environment. Thanks to RDM, Medsquare won all 3 public tenders of DACS from hospital purchasing groups in France – for a total of 160 university hospitals. This included AGEPS (Central Agency of AP-HP), a consortium of 39 university hospitals and the largest University Medical Center in Europe.

During the next 4 years, Medsquare's RDM will be deployed in most of the university hospitals in France: including those in Cochin, Hôpital Européen Georges Pompidou (HEGP), Lariboisière, Grenoble, Marseille, Nantes, Necker, Nice, Pitié-Salpêtrière, Reims, Tours and many others.

By carrying out these major projects, Medsquare's personnel are becoming experts in the field – and, thanks to the feedback from its highly skilled users, RDM keeps evolving.



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\*Dose Archiving and Communication System



# IN SMALL DOSES

## REDUCING DOSE TO IMPROVE THE LONG-TERM HEALTH AND SAFETY OF PREEMIES AND NEONATAL PATIENTS

*Interview with Prof. Dr. Maria-Helena Smet, Paediatric Radiologist in the Department of Radiology at University Hospitals Leuven (UZ Leuven) and Associate Professor at the Faculty of Medicine, University of Leuven (KU Leuven), Belgium*



**Maria-Helena Smet**

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To visit UZ Leuven's new, state-of-the-art neonatal and preemie NICU, you have to go through special measures, from careful hand and arm washing, to wearing gloves and removing rings, to wearing a gown over your clothes. But these are just a few of the precautions to protect the delicate patients, who face elevated health risks in several areas.

Other actions taken for patient safety are not so visible, yet are just as important, including the ongoing efforts of UZ Leuven's paediatric radiology department to reduce to the minimum the amount of radiation neonates (as well as other paediatric patients) receive. Professor Maria-Helena Smet, a Paediatric Radiologist at UZ Leuven, and her colleagues are spearheading efforts and research into dose reduction and image quality optimisation. Along with a multidisciplinary team, including Agfa HealthCare, she is carrying out the testing of CR and DR modalities to determine which allows the greatest dose reduction while still offering the image quality needed for the specialty. She sat down to explain the research, and why dose reduction is so important in paediatric radiology.

### How is neonatal and paediatric radiology different from imaging for adults?

**Prof. Smet:** Imaging is absolutely crucial for many of our NICU patients, who can have a broad range of pathologies, including the positioning and checking of catheters. One baby can require multiple images during a stay here, and may need additional images in the future.

But the imaging can be quite challenging. Between premature babies and other neonates you can have a huge size and weight difference: anything from an extremely premature baby weighing only 500 grams, to a full-term baby that can weigh from 2500 to 4000 grams. And each individual patient will change and evolve over time, rapidly and significantly. The chest of a grown man, for instance, will be essentially the same at 20 years, 30 years, 40 years... and the radiation dose will remain the same. This is not at all the case in paediatric imaging! And the smaller the patient, the more significant the changes.

With this smaller size, the structures being imaged are also smaller, as are the catheters. Some of the structures have a high contrast and some have very low contrast. And here in the NICU, we are often dealing with a broad range of pathologies that can be visible in the images. It's a very mixed population.

What's more, their cells are still developing and dividing. DNA repair after radiation is difficult and hence these patients are more susceptible than adults to stochastic effects, such as radiation-induced cancer. Radiation effects are known to appear a long time after the imaging process. The probability of a

stochastic effect is proportionate to the dose, but the severity is independent of absorbed dose. And it may occur without a threshold level of dose.

Finally, we must remember that radiation risks are cumulative throughout the patient's life! And while we are very pleased that our NICU and other paediatric patients have ever-greater life expectancies, there is also thus more time for carcinogenic effects to appear.

So we must find ways to lower radiation dose without impacting the quality of the imaging. We have achieved a lot in this area over the 30 years I have been practicing, and I believe there are still reductions to be found.

In this neonatal environment, our Agfa HealthCare DX-D 100 has been ideal. We got this mobile wireless DR solution in early 2014. It has proven very convenient, very smooth in operation, with a short turning circle that is ideal for the individual patient rooms in the new department. The detector fits into the incubator, and we can switch off the batteries when not in use, so battery life is longer. And of course the image quality is very good. In all, it fits right in.

### In this context, what does image quality mean to you?

In neonatal and paediatric imaging, the term image quality relates to whether an image allows me, in a clinical situation, to answer the clinician's question. If I can, then the image quality is good or good enough. So image quality isn't really something tangible but certainly has important consequences.

And as we follow the ALARA (As Low As Reasonably Achievable) principle for dose, image quality can even vary for a specific image, depending on what we need it for. An image that is not the 'highest' quality can in a certain case be perfectly suitable for our needs, allowing us to use a lower dose. On the other hand, there are radiologists who prefer to always have 'very high quality' for every image. This attitude does not fit the ALARA principle.

Image quality thus has two aspects: physical quality and clinical image quality. Physical quality is easier to measure: DQE, MTF, SNR, CNR...

But the clinical image quality is more personal, based on the viewer's preferences and needs. So, despite the physical quality parameters, the radiologist may say: "No, I don't like it, the image quality is not what I want or need." How to measure that perceived quality? One can make a visual grading analysis, look at statistics, etc., but it's difficult to test on very young patients. We have tested whether we can use the physical quality parameters to predict the clinical perception of image quality. In other words, is there a definable, measurable relationship between

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**“THE SMALLEST PATIENTS ARE ALSO THE MOST SENSITIVE. WE MUST FIND THE BALANCE BETWEEN QUALITY AND DOSE.”**

them? We found that in the present case, the physical measurements largely predicted the perceived clinical image quality.

There is an additional complication with digital imaging because the clinician is aware when dose is too low, but not when dose is too high. Low dose results in image noise but high dose just gives you very nice images, which can lead to something called ‘dose creep’ – slowly increasing dose to have ever ‘better’ images, when in fact images acquired at a lower dose would be sufficient to perform the clinical task. We need to eliminate this.

Of course, you can’t push dose reduction too far either. Sometimes it is a question of trial and error.

**What tools help you to control and reduce dose?**

First of all, we try to take only images that are necessary. For example, we might do an en face spine image but not a profile image, which increases lumbar dose, because we often have enough information from the first image.

Post processing is very important. I worked with Agfa HealthCare to adapt the second-generation MUSICA image processing software for neonatal use, and now I am working with them on the next generation, MUSICA 3. As I said, with these very small children you can have small structures with high or low contrast. MUSICA offers a proper balance between the contrasts, with a better preservation of low contrast details next to high contrast structures. You also need a very stable image processing to ensure standardised images.

Collimation is key, too. Consider an adult chest versus an infant chest. If the technician increases the field by 1 cm on top and bottom, this makes little difference for the adult. But for the infant, the proportional increase is huge! This can account for as much as 70% of the radiation dose.

We have to keep track of the dose each patient has received. For our fixed imaging modalities, we have integrated software that automatically records the technician, the dose, the parameters and the patient. So that information becomes part of the patient’s file. For our DX-D 100, we do the calculations ourselves, but we will add the software soon.

**How are you carrying out the modality testing?**

We have been testing three Agfa HealthCare detector systems: a CR system using powder phosphor, a CR needle-based phosphor system and a DR needle-based phosphor system. Our goal is to find the optimal parameter settings – the right mAs, the right kV, the right filtration – to allow us to use the lowest acceptable dose for diagnosis.

The testing is quite complex, and we have already acquired a total of 66 phantom images. These images were scored with



image quality criteria during three sessions, with every session taking about an hour. As a next step, we performed a comparative scoring test. I work on this in between my clinical responsibilities, and I see it as a necessary and logical part of my job. This makes my job very busy, yet rewarding in terms of scientific insights and quality improvement.

We do have some preliminary results. For example, our results indicate that we may be able to reduce dose up to 38% with the fine needle phosphor detector compared to the general powder phosphor detector, while still generating acceptable image quality. But we still have a lot of testing to do. For example, we need to subdivide the effect of filtration on image quality.

What’s key here is that, like in so much of patient care today, a multi-disciplinary approach will get the best results. To find ways to reduce dose, we can’t work in isolation, nor can manufacturers. So our team includes radiologists, clinicians, technicians, engineers, physicists, the manufacturer of the system – even statisticians! We need them all, and we keep in regular contact – that’s the best framework for this type of testing.

While the awareness of the importance of dose reduction has increased in the past years, it has always been an issue. In fact, it was one of the reasons I was attracted to the specialty of paediatric radiology 30 years ago. And we have made a lot of progress, thanks to better parameter settings, digital detectors, better training... Here at UZ Leuven, we already use a quite low dose. The high image quality we get from the needle-based CR and DR indicates that there is still further room to reduce dose. In other types of imaging, we see for example that the speed of CT is increasing, allowing less sedation or anaesthesia, and greater throughput. I would also like to see greater availability and increased speed in MRIs – with small children, speed is key!

We have to always remember – the smallest patients are also the most sensitive. We must find the balance between quality and dose. ■

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# IMPLEMENTING DOSE MONITORING SOFTWARE IN A RADIOLOGY DEPARTMENT

## MEETING THE CHALLENGES



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### Rationale

Precursors of quality management, quality control and quality improvement initiatives have been known since the early 20th century. However, the industrial revolution and particularly the rapid prosperity of the automobile industry raised quality issues to a new dimension, which soon became an integral part of industrial process management. In the last decades quality management also entered the healthcare system, and quality initiatives specific to the various category groups quickly evolved (McLees et al. 2015).

Quality management in radiology is manifold. Focusing on the customer perspective, its goals can be summarised as providing safe, effective, efficient, patient-centred and equitable diagnostic and therapeutic radiological care. Radiation safety has become more and more important (Hricak et al. 2011; Huda, 2015), because due to an increase in the number of examinations using ionising radiation population doses from medical imaging have increased by 600% in a few decades (Boone et al. 2012; Mettler et al. 2009; Schauer and Linton, 2009).

Examinations that are based on the use of ionising radiation need to be performed adhering to the three fundamental principles of the International Commission for Radiation Protection (ICRP) of “justification, optimisation, and limitation” (International Commission on Radiological Protection 2007). Justification involves that a well-trained individual assigns the most appropriate examination for a clinical indication, considering both the diagnostic information that is likely to be generated as well as the corresponding patient radiation doses and associated risks (ICRP, 2007; Sierzenski et al. 2014). Thus justification aims to limit the

number of unnecessary examinations and to provide a net patient benefit. The rationale of optimisation is similar to the ALARA (as low as reasonably achievable) principle (Huda, 2015; ICRP, 2007), implying that only that amount of radiation that is required to adequately address the diagnostic question must be applied. However, reduction of patient dose and risk should never be made at the expense of diagnostic imaging performance (McCollough et al. 2009). Rather the proportion of the informative value and the potential risks of an examination should be kept in good balance. The third principle, dose limitation, refers to dose limits that ought not to be exceeded, as otherwise an individual’s risk of suffering from stochastic dose effects (eg, radiation-induced cancer) would be unduly raised. Dose limitation is more of an issue in occupationally exposed individuals, who are obliged to permanently wear dosimeters in order to control radiation exposure and warrant keeping within annual dose limits as set by the responsible authorities. To stress the importance of radiation safety the European radiation protection legislation was updated lately, and now requires consequent monitoring of radiation exposure both of patients and medical staff (Council Directive 2013/59/Euratom). All member states are obligated to transpose the Directive into national legislation and to implement its requirements by 2018 (Council Directive (EC) 2013/59/EURATOM; Mundigl, 2015).

### Dose Monitoring Software Characteristics

Regarding control of patient radiation exposure one option is implementation of dose monitoring software. Several vendors have released dose management tools in the last years, all of them allowing for registration,

tracking and analysis of doses applied to patients, thus enabling monitoring compliance with the three fundamental ICRP principles.

Such software can be connected with any imaging device using ionising radiation. For computed tomography (CT) basic dose information of each patient and protocol includes the computed tomography dose index (CTDI), the dose-length-product (DLP) as well as the size-specific dose estimate (SSDE). After the scanning is finished the dose monitoring tool directly matches the dose data with predefined dose reference levels (DRLs), registers dose over time, and compares data of an individual patient with that of other patients, who underwent the same CT protocol. DRLs are dose values for indication-based examinations and are set by national authorities. They aim to provide guidance on what level of radiation protection is achievable with current competent practice and under the prevailing circumstances, but they are not constraints.

An important function of the software is that if the applied dose exceeds the DRL an alert tool transmits a message, which is visible on the survey page of the dose monitoring software. Therefore, radiographers immediately know after the scanning that dose limits were exceeded, and can place answers explaining the alerts within the comment box of the software. To assess dose performance for a defined period of time analysis of alert reasons and dose values should be made regularly (eg, once a month), thereby allowing for internal and external quality control and comparison with national or international reference values. Moreover there are possibilities to improve: if an alert is frequently caused by the same underlying reason (eg, patient not

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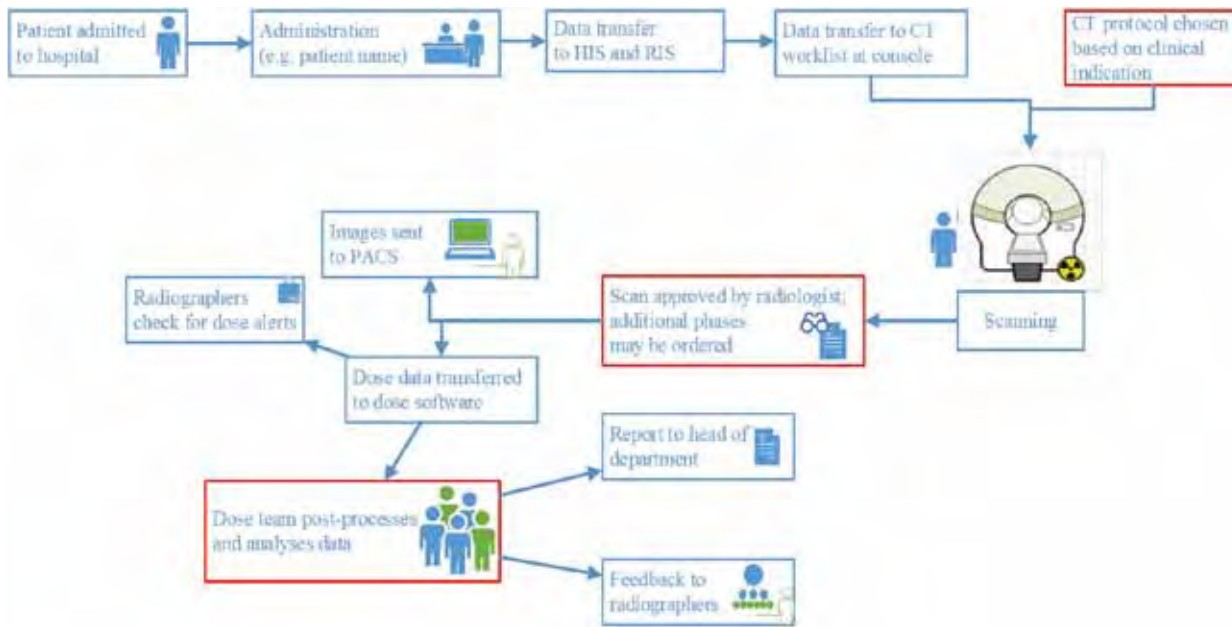


Figure 1. Workflow from Patient Admission to Dose Data Analysis and Feedback

precisely positioned in the isocenter of the scanner), rectifying measures may be undertaken (for example, extra training for radiographers).

**Implementation Considerations**

Before planning implementation of dose monitoring software you should be aware of some challenges that need to be met. A dose monitoring tool is software, which offers many options, but the available features may not match your department’s expectations and requirements. Awareness of what exactly the department’s needs are is essential at the beginning. Furthermore, one should be conscious of the fact that the software indeed is able to register dose data, but it cannot check for plausibility of data. Warranting high quality of data input is necessary and ultimately determines the usability of data output.

**Step 1: Determine Technical Strategy**

If these basic challenges are accepted the next step is to determine your technical strategy, which includes choosing the right dose monitoring software for your requirements. Consideration of the different modalities that should be linked to the software

is important, because not all software allows for connection with all modalities. Moreover, to ensure high quality of data input it should be verified that the software can communicate with the hospital information system (HIS) and radiology information system (RIS) and can also be integrated in the local network.

**Step 2: Define Organisational Strategy**

The next step is to define your organisational strategy, which comprises not only assigning the modalities, but also specifying the scanners/units that ought to be connected with the software. This is important, because within a department not all scanners/units may be from the same vendor and there might be differences concerning connection possibilities. This point also includes considerations about installation of the dose monitoring tool outside the radiology department, where x-rays are used as well (eg, coronary angiography suite).

Determination of one’s organisational strategy should also involve clearly setting the goals and expectations coming with the software, because implementation of a dose monitoring tool means extra work that so far is not financially compensated. You should be prepared to be confronted with internal resistance from colleagues owing to reasons such as reluctance to

**“SUPPORT, BACKING, AND SPONSORSHIP BY THE HEAD OF THE DEPARTMENT ARE CRUCIAL”**

change, lack of time, lack of awareness of the necessity to change and fear of the unknown. Therefore, support, backing, and sponsorship by the head of the department are crucial.

To successfully implement the software in clinical routine it is advisable to start with one modality only, which preferably should be CT, because CT scans are more standardised than for example fluoroscopy-guided procedures, at which various levels of difficulties need to be considered. Moreover, in most countries national DRLs for indication-based CT examinations are available, which facilitate setting dose thresholds.



**Figure 2.** An additional computer with the dose monitoring software permanently running was placed next to the CT console to assist dose control and support dose culture.

**Dose Team**

To promote implementation of the software, represent dose culture and have contact persons, formation of a dose team is recommended. Ideally this should be composed of one or two radiographers, one board-certified radiologist and the department’s IT specialist. Together with the head of the department the dose team should define a few appropriate, measurable, and achievable goals. As particularly at the beginning the dose team faces many tasks, including becoming familiar with the software, they should have protected time for their work.

One of their first challenges is to set reasonable dose reference levels; in our department we either used Swiss DRLs, so far available for 21 indication-based CT examinations (Swiss Federal Authority of Healthcare 2010), or we derived thresholds by determining the 75th percentile of the distribution of a defined dosimetric quantity.

**Lessons Learnt**

After we had installed the dose monitoring software and had started

dose data analysis of our CT scanners, we had to solve unanticipated problems.

**1. Data Output Relates to Input Quality**

Although we knew that a dose monitoring tool is software, we were not aware that data output depends extensively on the quality of the input. One of our main challenges was to match our own CT protocols with the available national DRLs. For example, our abdominal CT protocols comprise “abdomen and pelvis: unenhanced”, “abdomen and pelvis: contrast media-enhanced”, “liver protocol”, “pancreas protocol” etc., and national DRLs are separated into “abdomen 1: liver, spleen, pancreas, vessels” or “abdomen 2: standard, abscess, emergency”. Thus our internal processes required intensive adaptation at the beginning, which included cleaning our CT protocol list with removal of no longer employed CT protocols (eg. from former scanners), definition of precise protocol descriptions and uniform usage of protocol names, because for the software the

protocol name “unenhanced abdomen” is not synonymous with “abdomen unenhanced”. Thereafter the different CT protocols were assigned to the national DRLs, if available, or to our own set thresholds.

**2. Protocol Changes Not Recognised**

When we started with data analysis we frequently encountered the problem that the software did not recognise changes of protocol made after scanning had already started. For example, a patient with rectal carcinoma was enrolled for a CT of the abdomen and, based on this indication, the CT protocol “abdomen standard (single phase)” was chosen. But due to a so far unknown liver lesion a second phase was ordered by the radiologist on approval of the scan. However, in this case the software compares the scan’s dose data with the DRL for “abdomen standard”, unless the protocol name is changed manually to “abdomen portal-venous and delayed phase”. This modification of protocol name is possible within the software as



part of the post-processing, and considerably enhances quality of data analysis by limiting the number of false-positive dose alerts. Figure 1 provides a survey of the different processes involved in radiation safety quality control.

### 3. Change Resistance

Particularly at the beginning, resistance to change is often encountered, based on perceived nuisance and extra work, but also due to neglect when a task was not part of clinical routine before. To overcome this resistance and improve compliance it is important to integrate dose monitoring into the daily workflow and to establish a dose culture. We therefore placed an additional computer next to the CT console, on which the software was permanently running (see Figure 2). By immediately displaying the patient dose data, the radiographers' awareness regarding radiation safety increased.

### 4. Optimisation Processes

After having successfully implemented the software in clinical routine, dose data should be collected for several months before optimisation processes are started. The reason is that optimisation ought to be based on valid data, which are the premise to achieve effective and efficient improvements. It is better to first focus on one modality as well as on the most frequent protocols, as too many changes made at one point may cause confusion, data disorder, and excessive demands of the staff, ultimately leading to failure of the whole dose monitoring project.

### 5. RIS Integration

Despite being challenging at the beginning there are several advantages that compensate for the efforts to integrate the dose monitoring tool into the RIS. Among these especially the automatic registration of protocol changes during the scanning is valuable because it considerably alleviates dose data post-processing and analysis (no manual change of protocol name is required) and improves quality of data output. The RIS integration also allows for an automatic display of dose data on each radiological exam report and would enable the use of only one single master IT-system, thus significantly enhancing the convenience when dose monitoring software is applied.

### Conclusions

Dose monitoring software is a valuable tool for internal and external quality control of dose data. It can be successfully integrated in clinical routine and increases patient and business safety. However, implementation of a dose monitoring tool is a demanding task that requires the support of the head of the department. It is advisable to build a multidisciplinary dose team, which assists in software integration in daily routine and accomplishes a dose culture. It should always be kept in mind that the tool is a software with the quality of data output largely relying on data input. Because of that dose culture and processes have to be created and implemented by the users, which needs time and resources. ■

### Key points

- ✓ Quality management and control are integral parts of the healthcare sector.
- ✓ A key feature of quality control in radiology is monitoring radiation exposure of patients, which can be accomplished by dose monitoring software.
- ✓ Implementation of dose monitoring software is a challenging task that requires additional work and teamwork.
- ✓ When planning implementation of dose monitoring software, you should consider your department's needs, requirements and goals in detail.
- ✓ It is advisable to perform implementation of dose monitoring step-by-step, starting with one modality first (preferably computed tomography).
- ✓ Despite continuous further development of the software, one should be aware that the quality of the software's output largely depends on the quality of the input.



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# PORTABLE ULTRASOUND IMAGING SYSTEMS

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Portable Ultrasonic Scanning systems provide two-dimensional (2D) images of soft tissue and moving structures (eg, heart, fetus) for a variety of clinical applications. Depending on the transducer and calculation packages available, portable scanners can be used for abdominal, obstetric/gynaecologic, urologic, small-parts (eg, thyroid, prostate, breast), cardiac, and other examinations. Portable systems typically weigh less than 23 kg (50 lb), and are compact and lightweight enough to be carried by hand between exams.

### Key Considerations


- Portable Ultrasound (US) systems come in three different configurations: (1) **Handheld**, (2) **Tablet computer** or (3) **Laptop computer**. Handheld US scanners are compact enough to be held in one hand during use while the transducer is held in the other hand. Tablet-style US systems have a similar user interface that includes an imaging display screen and a variety of controls activated through a touch screen. Laptop-based US systems typically have the most user-adjustable controls and imaging capabilities and are the most similar in function to full size, cart-based US systems.
- When purchasing any type of US system, facilities need to consider six basic issues: **functions** and **features**, **cost**, ease of use, **upgradeability**, **image storage**, and customer support.
- For portable US systems, additional considerations include size, weight, transducer options, and the availability of **advanced imaging modes**.

- Some portable systems may include additional transducers to facilitate more specialised cardiac, vascular, endovaginal, endorectal, or small-parts diagnostic procedures.
- A variety of transducers (also called “probes”) are typically available for use with portable systems. Many of the probes that are currently offered on popular systems are listed in the comparison table below.
- A number of portable US systems now offer advanced scanning features such as harmonics, Doppler colour flow mapping (CFM), and three-dimensional (3D) imaging. A few systems include additional advanced features that were typically only seen on full-size US systems, until recently.

### Other Considerations

The availability of relatively inexpensive and easy-to-use portable ultrasound scanners has led to the technology being adopted by numerous non-imaging medical professionals for a wide range of point-of-care (POC) applications. These include anaesthesiology, endocrinology, rheumatology and sports medicine. Manufacturers have recognised that the POC ultrasound market is growing and they have begun to produce ultrasound systems that are designed to meet the demands of specific POC applications.

Many portable scanners now include Doppler capability to determine the direction and speed of blood flow. Doppler capabilities may include spectral Doppler, either continuous wave (CW) or pulsed wave (PW). Harmonic imaging is also available



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on some portable US scanners. Harmonic Imaging (HI) is a version of B-mode that, in many cases, improves image quality over that provided by

## Comparison of Key Features on Popular Models

Attribute	FUJIFILM SonoSite EDGE	FUJIFILM SonoSite S Series	GE LOGIQ e	GE Venue 50	Mindray M7	Philips CX50	Siemens ACUSON Freestyle	Siemens ACUSON P300	Terason uSmart 3200T
<b>PROBE OPTIONS</b>									
Linear array	L38xi/10-5, L25x/13-6, HFL38x/13-6, HFL50x/15-6	L38xi/10-5, HFL38x/13-6, L25x/13-6, SLAX/13-6	8L-RS, 9L-RS, 12L-RS, 16L-RS,	12L-SC, L8-18i-SC	7L4s (5-10), L14-6s (8 - 11), L12-4 (6 - 10),	L12-3	L8-3 (3 - 8), L13-5 (5-13)	LA523 (5-12), LA435 (6-18), LA522E (3 - 12)	15L4
Convex array	C8x/8-5, C11x/8-5, C60x/5-2	C60x/5-2, C11x/8-5 curved array	8C-RS, 4C, RS,	4C-SC, 10C-SC	4CD4s (2.5 - 6), C5-2s (2.5 - 6)	C5-1 PureWave, C8-5	C5-2 (2-5)	CA431 (1-8), CA123 (3-9)	5C2
Phased/Vector array	P21x/5-1, P10x/8-4	P21x/5-1, P10x/8-4	3S-RS, 6S-RS	3S-SC	P4-2s (2 - 3.6), P7-3s (3.6 - 7),	S5-1 PureWave, X7-2t PureWave, S8-3	NA	PA122E (3-80), PA023E (4-11), PA230E (1-4)	4V2
Multifrequency	Yes	Yes	Yes	Yes	Yes (all probes)	Yes	Yes	Yes	NA
Endovaginal	ICTx/8-5	ICTx/8-5	E8CS-SC	E8CS-SC	V10-4s (5 - 8), V10-4Bs (5 - 9)	C9-3v PureWave	NA	EC1123 (3-9)	8EC4
Endorectal	N/A	ICTx/8-5	E8CS-SC	NA	V10-4s (5 - 8), V10-4Bs (5 - 9)	No	NA	Not specified	8EC4
TEE	TEEx/8-3<1>	TEEx/8-3	6Tc-RS	N/A	3.1-7.2	X7-2t xMatrix	NA	No	NA
CW	D2x	NA	N/A	N/A	2	D5cwc	NA	2MHzCW (2), 5MHz CW (5)	Yes
Others	SLAx and L52x linear intraoperative probes	Not specified	i12L-RS, i739L-RS, and T739L-RS linear intraoperative probes	NA	Not specified	L15-7io intraoperative	NA	LP323 (5-12) Laparoscopic, intraoperative IOE323 (5-12)	16HL7
SCAN MODES	B-mode, B-mode tissue harmonic imaging, M-mode	B-mode, color Doppler, power Doppler, M-mode, broadband	B, M-mode, anatomic M-mode,	B-mode, M-mode, Needle recognition mode	B-mode, M-mode, B+M-mode, B+B, Quad B	B-mode, M-mode and freehand 3-D	B-mode	B-mode, colorized B-mode, M-mode	2-D digital imaging, M-mode, color Doppler, PW Doppler, power Doppler, directional power Doppler, CW Doppler, triplex, harmonic imaging
DOPPLER MODES	Color Doppler, power Doppler, PW, PW Tissue Doppler, CW Doppler	Color Doppler, color power Doppler, PW, PW tissue Doppler, CW	Color Doppler, power Doppler, PW Doppler, optional CW Doppler	Color Doppler, power Doppler	Color Doppler, power Doppler, PW, CW, TDI	PW Doppler, steerable CW Doppler, CDI, color power angio, HPRF, TDI, RDI	Color Doppler imaging, power Doppler imaging	PW, CW, CW Doppler, color Doppler velocity, color Doppler energy	Color Doppler, PW Doppler, power Doppler, directional power Doppler, CW Doppler
ANALYSIS PACKAGES	Vascular Analysis, Cardiac Analysis, Obstetric Analysis	Cardiac Analysis	Vascular Analysis, Cardiac Analysis, Obstetric Analysis	Obstetric	Vascular Analysis, Cardiac Analysis, Obstetric Analysis	Vascular Analysis, Cardiac Analysis, Obstetric Analysis	NA	Vascular Analysis, Cardiac Analysis, Obstetric Analysis	Vascular Analysis, Cardiac Analysis, Obstetric Analysis
Other Analysis Packages	CIMT, transcranial Doppler	None specified	General, abdominal, small parts, gynecology	Abdominal, adult/neonatal cephalic, anesthesia, interventional, musculoskeletal, small organ	Urology, orthopedics, prostate, small parts, breast, abdomen	QLAB, 3DQ, ROI, MVI, SQ, TMQ, IMT, radiology, cardiology	Distance, ellipse, area	Quality Intima Media Thickness (QIMT), tissue velocity mapping:(TVM), anatomic M-mode	None specified
MONITOR, cm (in)	30.7 (12.1) LCD	26.4 (10.4) LCD	38.1 (15) high resolution LCD	30.7 (12.1)	38 (15)	Single, 38 (15) high definition	38.1 (15) high bright LCD or LED	38.1 (15) XVGA LCD	29.2 (11.5)
H x W x D, cm (in)	6.4 x 31.5 x 32.7 (2.5 x 12.4 x 12.9)	38.4 x 29.5 x 15.5 (15.1 x 11.6 x 6.1)	7.6 x 35.1 x 33.8 (3.1 x 13.8 x 13.3); 6.4 x 35.1 x 29.7 (2.5 x 13.8 x 11.7) not including handle	28.2 x 27.4 x 5.6 (11.1 x 10.8 x 2.2)	36.1 x 7.5 x 35.7 (14.2 x 3 x 14.1)	7.6 x 41.3 x 35.6 (3 x 16.3 x 14)	33.5 x 37.3 x 12.1 (13.2 x 14.7 x 4.8)	Closed: 18 x 35 x 49 (7.1 x 13.8 x 19.3); working position: 43 x 35 x 49 (19.3 x 13.8 x 19.3)	22.2 x 31.8 x 3.2 (8.8 x 12.5 x 1.3)
WEIGHT, kg (lb)	3.85 (8.5)	3.8 (8.5) without battery	4.6 (10.1)	4 (8.8) with probe	6 (13.2)	6.2 (13.6)	4.8 (10.5)	9 (19.4)	2 (4.5)
POWER REQUIREMENTS	Battery or AC power, 100-240 VAC, 50/60 Hz	100-240 VAC, 50/60 Hz	100/240 VAC, 50/60 Hz, 130 VA with peripherals	100-120 VAC or 220-240 VAC, 50/60 Hz	110/240 VAC, 50/60 Hz	100/240 VAC, 50/60 Hz, 500 VA	100-240 VAC 50/60 Hz, max power consumption 0.08 kVA	100/240 VAC, 50/60 Hz	100/240 VAC, 50/60 Hz

A complete list of Technical Specifications for these models is available upon request

conventional B-mode imaging.

Before purchasing a portable ultrasound scanner, buyers should consider scanning system functions and features

relative to the number and types of procedures to be performed and choose probes and calculations packages accordingly.

Service and Support Information:

- Typical Warranty Coverage: 1 - 5 Years
- Estimated Service Life: 7 Years ■





# MAMMOGRAPHIC SCREENING FOR WOMEN WITH DENSE BREASTS

INTERVIEW WITH PROF. DIANA MIGLIORETTI



**Diana Miglioretti**

Dean's Professor  
in Biostatistics  
University of  
California Davis  
USA

**A**s breast density legislation is introduced in more and more states of the USA to inform women that they have dense breasts and to promote discussion of supplemental screening, research into technology, frequency and other factors continues.

A study by the National Cancer Institute-funded Breast Cancer Surveillance Consortium (BCSC), published 18 May in *Annals of Internal Medicine*, led by Prof. Karla Kerlikowske, Departments of Medicine and Epidemiology/Biostatistics, University of California San Francisco, looked at interval cancer rates in women with dense breasts. The research aimed to determine which combinations of breast cancer risk and Breast Imaging Reporting and Data System (BI-RADS) breast density categories are associated with high interval cancer rates. The prospective cohort study analysed data collected from the Breast Cancer Surveillance Consortium from 2002 to 2011, which included 365,426 women aged 40 to 74 years who had 831,455 digital screening mammography examinations. Cases were evaluated by BI-RADS breast density, BCSC 5-year breast cancer risk, and interval cancer rate (invasive cancer  $\leq$ 12 months after a normal mammography result) per 1000 mammography examinations. High interval cancer rate was defined as more than 1 case per 1000 examinations. Almost half the women in the study had dense breasts, and the proportion with heightened five-year risk was highest among those with extremely dense breasts.

The highest interval rate of advanced-stage disease ( $>0.4$  case per 1000 examinations) was observed among women with 5-year risk of 2.50% or greater and heterogeneously or extremely dense breasts (21% of all women with dense breasts).

High interval cancer rates were observed for women with 5-year risk of 1.67% or greater and extremely dense breasts or 5-year risk of 2.50% or greater and heterogeneously dense breasts (24% of all women with dense breasts).

Five-year risk was low to average (0% to 1.66%) for 51.0% of women with heterogeneously dense breasts and 52.5% with extremely dense breasts, with interval cancer rates of 0.58 to 0.63 and 0.72 to 0.89 case per 1000 examinations, respectively.

Women with extremely dense breasts and intermediate to high five-year breast cancer or heterogeneously dense breasts and high five-year breast cancer risk were at highest risk for developing breast cancer after a normal mammogram.

The authors note that the study is limited in that they did not assess the benefit of supplemental imaging for women with dense breasts. They conclude, "Breast density should not be the sole criterion for deciding whether supplemental imaging is justified because not all women with dense breasts have high interval cancer rates. BCSC 5-year risk combined with BI-RADS breast density can identify women at high risk for interval cancer to inform patient-provider discussions about alternative screening strategies."

*HealthManagement.org* spoke to one of the researchers, Prof. Diana Miglioretti, Dean's Professor in Biostatistics, University of California Davis about the study.

**The publication of this research is very timely as more states in the U.S. enact breast density legislation\*. Is this the first study of its kind? Why did the Breast Cancer Surveillance Consortium set out to investigate this?**

This is the first study that looked at interval cancer rates in women with

dense breasts combined with a breast cancer risk score. We set out to identify subgroups of women who have the most potential to benefit from supplemental imaging given that about half of women of screening age in the U.S. have dense breast tissue. Our prior research estimated this to be 28 million women of screening age in the U.S. To us, that seemed like a lot of women to consider for supplemental imaging given the current options are associated with potential harms such as high false-positive rates.

**The paper mentions "sufficiently high interval cancer rates?" How was this determined?**

Our threshold for "sufficiently high interval cancer rates" was based on prior research for which we used an expert panel to identify minimally acceptable screening mammography interpretive performance measures (in other words, thresholds for what would be an acceptable level of accuracy interpreting mammography).

**What do you hope will follow on from this research? How should women interpret this?**

I hope advocacy groups that are encouraging use of supplemental imaging in women with dense breasts, and legislators passing laws in the U.S., will understand that breast density should not be the sole criterion for identifying women who should consider supplemental imaging. Breast cancer risk combined with breast density categories can identify women for whom supplemental imaging discussions are most appropriate, because women with intermediate to high breast cancer risk in combination with breast density are at highest risk of a cancer being missed on mammography. Many women with dense breasts are not at increased breast cancer risk in general, and not at high risk of having a

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breast cancer missed by mammography. Use of supplemental screening in these lower risk women may increase the harms associated with cancer screening with minimal potential increase in benefit.

**Is further research planned that might look at this population of women and use of supplemental imaging such as tomosynthesis and/or breast ultrasound or increased frequency of screening?**

We hope to conduct a similar study among women being screened with digital breast

tomosynthesis. We are also evaluating the performance of screening breast ultrasound in community practice by breast density and breast cancer risk to better quantify the potential benefits and harms. In addition, we recently improved the Breast Cancer Surveillance Consortium (BCSC) breast cancer risk model by adding history of benign breast diseases such as atypical hyperplasia and lobular carcinoma in situ. Our paper is in press and the new risk calculator will be released once it is published. ■

**Breast Cancer Surveillance Consortium Risk Calculator**

The BCSC risk calculator includes age, family history of breast cancer, history of breast biopsy, breast density and race. The BCSC risk calculator can be found on the web: <https://tools.bcsc-scc.org/BC5yearRisk/intro.htm>. It is also available as a free iPhone and iPad app: <https://itunes.apple.com/us/app/bcsc-risk-calculator/id919034661?mt=8>



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\* 24 states have enacted breast density legislation at time of publication. Are You Dense Advocacy maintains a map at [www.areyoudenseadvocacy.org/dense](http://www.areyoudenseadvocacy.org/dense)



# IMPLICATIONS OF DENSE BREASTS

## INTERVIEW WITH PROF. MURRAY REBNER



**Murray Rebner**

Professor of Diagnostic Radiology and Molecular Imaging Oakland University William Beaumont School of Medicine Rochester, Michigan USA

Prof. Murray Rebner is Immediate Past President Society of Breast Imaging; Professor of Diagnostic Radiology and Molecular Imaging, Oakland University, William Beaumont School of Medicine; Director, Division of Breast Imaging, Beaumont Health System, Royal Oak Campus. *HealthManagement.org* spoke to Prof. Rebner recently about the hot topic of breast density.

**Legislation to inform women about their breast density is now in place in many states. Do you think primary care doctors, radiologists and women are well informed about the issue?**

I think that most primary care doctors and women in the United States have, at best, a rudimentary understanding of the issue of breast density. They have learned that increased density makes it harder to interpret a mammogram, but they probably do not know what to do with the information.

Radiologists are far more likely to be aware of the implications of breast density since they are the ones who decide what density type is associated with a patient's

breasts. They are the ones who should have access to the woman's personal and family risk factors for breast cancer, and they may suggest that the patient undergo a risk assessment evaluation, consult with a genetic counsellor or receive supplemental screening.

**Is enough known about breast density and breast cancer risk?**

We are discovering more about breast density and breast cancer risk, but we still need to learn more. For example, it is now clear that stromal cells in the tumour microenvironment play an important role in cancer development. If the mechanism of this "cross-talk" could be better defined, then specific inhibitor agents might be developed to arrest the process. Also, is there a critical mass of stromal tissue which is needed for this to occur? If yes, accurate breast density measurements would take on greater importance. Finally, are there genetic mutations which impart a high risk of breast cancer development that are also associated with increased breast stromal content?

**Tomosynthesis is now reimbursed by the Centers for Medicare and Medicaid Services in the United States. Do you foresee that tomosynthesis will become the most prevalent screening technology or where there still be a role for MRI and ultrasound for certain risk groups?**

It is apparent that we have entered the era of personalised breast cancer screening. I believe that tomosynthesis will eventually replace standard digital mammography (DM) as the primary breast cancer screening tool. Studies to date have shown that it detects more curable, invasive breast cancers in women of all breast densities, and it also lowers recall rates for women with different breast densities compared to standard DM. Supplementary screening (in addition to mammography, not as a replacement for mammography) with MRI and ultrasound is becoming more widespread. Combining MRI with mammography to screen women at high risk for breast cancer increases sensitivity by almost threefold; however, the specificity typically remains lower compared to mammography. In women with dense breasts, screening with automated



ultrasound combined with mammography can detect an additional two cancers per thousand women screened; however the specificity is less than mammography alone. MRI screening usage has increased over time; however, ultrasound screening has not been widely utilised by the American radiology community. The time to perform and interpret the studies are barriers to its acceptance. Abbreviated breast MRI screening may ultimately prove to be the supplementary screening modality of choice.

**Would you like to comment on the polarisation of opinion on the pros and cons of mammographic screening? Does this heated debate help or hinder early detection of breast cancer, for example.**

I believe that the polarisation of opinion on the pros and cons of mammographic screening has left women confused, and has hindered our ability to detect breast cancer at its earliest point of development. Unfortunately, the science of breast cancer screening is not straightforward.

Organisations such as the Society of Breast Imaging and the American College of Radiology are trying to present the facts in a clear, intelligible fashion. What is clear is that mammography saves lives. Since the 1980s, when mammography utilisation

became widespread in the United States, breast cancer mortality has decreased by 30%. Population-based screening programmes in Sweden, the Netherlands and Norway have shown similar mortality reductions. Panels such as the United States Preventive Services Task Force have members who do not treat breast cancer patients and have no expertise in breast cancer screening. However, they are making a value judgment that the harms of mammography outweigh its benefits. Also, the issue of overdiagnosis is

overstated. It is not in the 20-50% range as purported by some authors; when all the correct variables are accounted for it is less than 10% and the majority of the cases represent non-invasive tumours. The media is also at fault. They are

**“TOMOSYNTHESIS WILL EVENTUALLY REPLACE STANDARD DIGITAL MAMMOGRAPHY AS THE PRIMARY BREAST CANCER SCREENING TOOL”**

quick to report on the anti-screening publications; however, we almost never see coverage of papers which demonstrate a benefit from early detection by screening. Women should have discussions about breast cancer screening with their healthcare providers and they should make informed decisions about their own health care. However, in order to do this, they and their healthcare providers need to have accurate, evidence-based information at their disposal. We are working hard to provide the facts. ■

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# MRI IN WOMEN WITH EXTREMELY DENSE BREASTS

INTERVIEW WITH DR. CARLA VAN GILS

## Carla van Gils

Associate Professor of Clinical Epidemiology  
University Medical Center Utrecht  
The Netherlands

The first randomised controlled trial (RCT) on MRI and mammography in women with extremely dense breasts is underway in the Netherlands. Breast Cancer Screening With MRI in Women Aged 50-75 Years With Extremely Dense Breast Tissue: the DENSE Trial ([clinicaltrials.gov/ct2/show/NCT01315015](http://clinicaltrials.gov/ct2/show/NCT01315015)) aims to determine the cost-effectiveness of biennial screening with mammography and MRI compared to mammography alone in women aged 50-75 years and who show > 75% mammographic density (Emaus et al. 2015). Participants are recruited via the Dutch National Breast Cancer Screening Programme.

### Breast Screening in the Netherlands

The Dutch National Breast Cancer Screening Programme was established in 1990.

Women in the Netherlands aged from 50 to 75 years (approximately 2.6 million women) are invited for a two-view mammogram every two years. The participation rate is approximately 80%; in 2012 1,008,644 women were screened (National Evaluation Team for Breast Cancer Screening 2014). Screening is available at 67 predominantly mobile mammography units. Two radiologists independently read all mammograms, and they must reach consensus to refer a woman for further clinical assessment. Since the programme was established mortality has decreased by more than 30%, due partly to screening-based early detection and treatment, and partly to improved treatment methods.

### The DENSE Trial

*HealthManagement.org* spoke to Dr. Carla van Gils, Associate Professor of Clinical Epidemiology, University Medical Center Utrecht (UMCU), principal investigator of the DENSE trial.

The primary outcome measure of the DENSE trial will be the number of interval cancers in the MRI group and the control group. In order to be an effective screening strategy, the extra MRI screen-detected cancers have to be accompanied by a subsequent reduction in interval cancers. The intervention will be carried out for 3 screening rounds (ie six years). Secondary outcomes will include the number of MRI screen-detected cancers, a comparison of tumour size, stage and grade distributions diagnosed in both groups, mortality rate (estimated through simulation models), the positive predictive value of MRI, the cost-effectiveness of MRI and the impact of MRI screening on quality of life. The primary completion date is December 2019.

### Why is the cut-off for density chosen greater than 75%?

The cut-off at greater than 75% equals the ACR density category 4: extremely dense breasts. This cut-off point is chosen, because the gain is expected to be higher for these women than for the women with heterogeneous density.

### Why is contrast-enhanced MRI the modality under investigation?

We have chosen to investigate the value of MRI, because the sensitivity of MRI is higher than the sensitivity of

other modalities such as ultrasound or tomosynthesis.

### How will breast density be measured, and what information will women be given about their breast density?

Breast density is estimated by using a fully automatic and validated method (software) to estimate the volume of dense tissue in the breast. Women in the intervention group receive an invitation letter accompanied by an extensive information brochure. This brochure includes information on the effects of breast density on the sensitivity of mammography and breast cancer risk. The results of the intervention group will be compared to women who receive standard care. In the Dutch breast cancer screening programme it is not standard practice to inform women about their breast density.

### How will cost-effectiveness be estimated?

Microsimulation Screening Analysis (MISCAN) is a breast cancer simulation model that has been developed for building models for cancer screening in a dynamic population. We will collect data on the costs of additional diagnostic work-up after positive MRI examination, breast cancer treatment and follow-up cancer care during the trial. Nonattendance at work and reduced work performance will be registered. The costs and effects will be calculated for a simulated cohort of 1 million women for a period of 10 years after the start of screening (using MISCAN). The cost-effectiveness will be expressed as cost per life-year gained. ■



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Speech recognition systems for physicians to use to dictate letters and reports promise increased efficiency and reduced transcription costs. Systems can either be front-end (speech to text recognition in real time) or back-end (speech to text conversion after the dictation has taken place).

KLAS Research interviewed health-care providers about three front-end systems, and has published its report *Front-End Speech: What are the Value-Adds?* by Boyd Stewart and Austin Cameron. KLAS spoke with 88 organisations. Of these, 20 were live with Dolby Fusion SpeechEMR (EMR), 33 were live with M\*Modal Fluency Direct (EMR), and 35 were live with Nuance Dragon Medical 360 NE (EMR). The report discusses the key performance differences between the Dolby, M\*Modal and Nuance front-end speech (FES) solutions and looks at why health-care providers chose these vendors. At the time of publication of this report, M\*Modal was the only solution based in the cloud. Nuance's solution was not yet live.

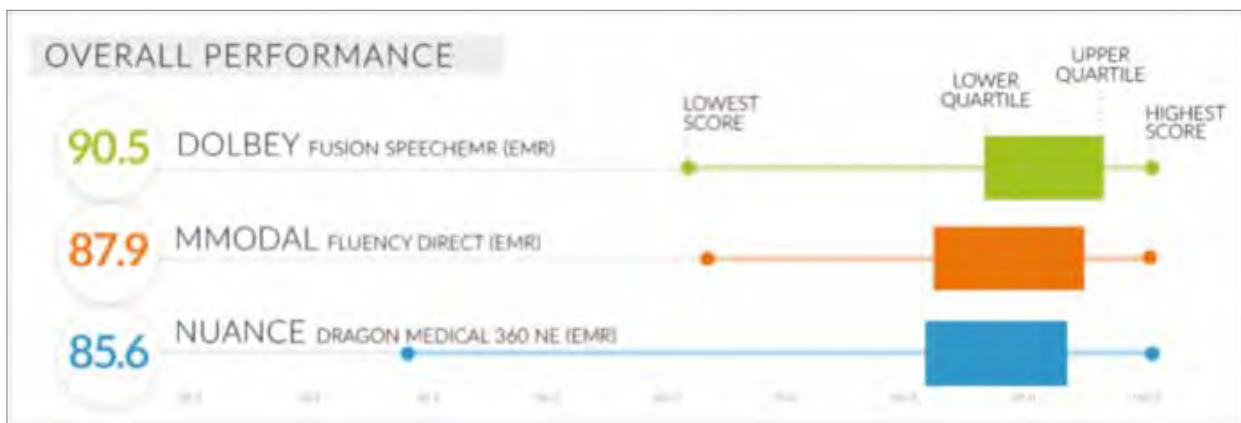


Figure 1

**Overall Performance**

Healthcare providers were asked about three products:

1. Fusion SpeechEMR (Dolbey)
2. Fluency Direct (M\*Modal)
3. Dragon Medical 360 NE (Nuance) (see Figure 1)

**Ease of Use**

As FES takes longer to learn than most other processes, clinicians may be reluctant to take the time to train in their use. Each vendor in the report scored 7.7 for ease of use. Healthcare providers cited some usability issues for each vendor:

Dolbey users praise its stellar partnership and hand-holding. Most find the product easy to use with a reasonable learning curve. Some complained of poor interfacing to the electronic medical record or lack of intuitiveness.

M\*Modal users find the cloud-based solution easy to work with, and many feel M\*Modal is functionally the strongest solution around. Most users need only a short time to train up. However, some have had issues with report accuracy. In addition the cloud-based functionality means that adoption and training is not simple for all users.

Nuance users are attracted to use this solution, because it has been around for a while. Once they have been trained, many doctors find it easy to use. Some users complain that Dragon does not remember words it has been trained to recognise, and others feel that they do not receive sufficient training or support.

**Market and Mindshare**

Nuance has dominant market share currently, and has strong relationships with vendors, including Cerner. Healthcare providers tend to consider Nuance when looking at purchasing or replacing a FES system. Dolbey and M\*Modal have lower mindshare than Nuance. Nuance has the reputation of reliable and advanced technology and is perceived as the low-risk option.

**Vendor Value and Support**

M\*Modal's cloud offering has comparatively low upfront and maintenance costs, easier scalability and a short learning curve. Several Dolbey clients

included in the report noted that they had achieved significant return on investment (ROI) from a dramatic reduction in transcription costs. Nuance is seen as the most expensive solution; most users are willing to pay a higher price because they see value from the solution. Several Nuance clients noted their disappointment at extra cost incurred due to unexpected upgrades and from longer than expected implementation and functionality delivery.

Dolbey has continued to deliver a quality product and service to new clients amid significant growth. Many Dolbey users praised Dolbey's client support from implementation onwards. M\*Modal's account support is praised by several clients. While many Nuance clients are satisfied with

the product, some were frustrated by lack of follow-up when addressing challenges (see Figure 2).

**About KLAS Research**

KLAS works with over 30,000 people in 5,000 hospitals and nearly 3,000 ambulatory organisations. KLAS sources its information predominantly from the United States. KLAS data and reports represent the combined opinions of actual people from provider organizations comparing how their vendors, products, and/or services performed when measured against participants' objectives and expectations.

KLAS findings are a unique compilation of candid opinions and are real measurements representing those individuals interviewed. ■

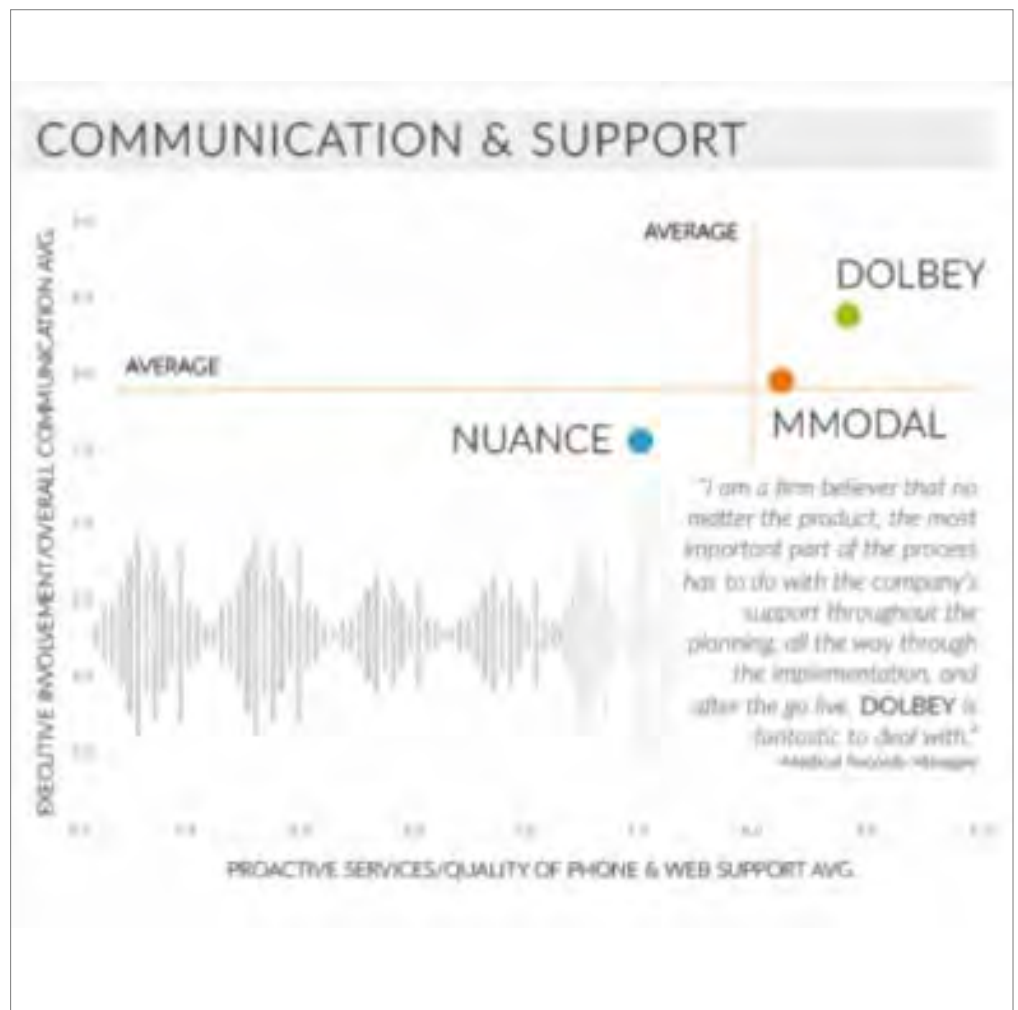


Figure 2



# RADIOLOGY

## THE END OF THE ROAD?



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Until very recently, radiology was looked upon very favourably by many seniors at American medical schools. As they finalised their choice of residency training, our specialty had acquired an allure based on the exciting technology at our disposal, the relatively high income available to newly minted graduates of fellowship programmes, (because nearly all those completing residency programmes in America have chosen to take an additional year of subspecialty training), the diversity of job opportunities available to them in private and academic practice and the regular schedule of time on and time off, allowing work and play demarcations to be regular and manageable.

In the U.S., radiology, as customarily regarded, fitted within the acronym of R.O.A.D. as a set of medical disciplines with commonalities of advantages. The abbreviation stood for the R as Radiology, O for Ophthalmology, A for Anaesthesiology, and D for Dermatology. All are specialties relatively well compensated at career entry and even better as one gets established. Moreover each offered the prospect of a congenial lifestyle. But now events and attitudes point to bumps in the ROAD as the R seems imperiled.

Now such a preoccupation with impending disinclination towards and disfavour for a thing or idea, if you will, is often a function of both perception and plausibility. And the perception of senior medical students has been informed by certain facts characteristic of how medicine is organised and rewarded in the U.S., and also by how technology is seen to be changing our scope of work. Currently, and for the past few years, CT and MR growth has stopped and even declined in some jurisdictions and among some payers, too, including the federal government. Consequently the growth of private practice receipts has also lessened, and job possibilities for the recently trained have therefore decreased. Hence it is a realistic presentiment that opportunities will be further constricted when

those students now considering a radiology career may not find a position six years later when internship, residency, and fellowship are completed. For them radiology may be deemed to be ultimately a dead end.

And for those who train our up-and-coming specialists, even today radiology's place on the road is full of potholes. Of the approximately one thousand positions offered in the match, the national process aligning applicants with training programmes, 137 were not filled initially by either American or foreign students. Only 650 American graduates applied for a residency slot. Thus, in order to complete its complement of first year trainees to begin July 1, 2016, many programmes needed to scramble to find enough suitable candidates willing to come. Few programmes chose to close, but if present trends continue more will have to do so next year. Of the 23 specialties for which positions in residencies were allocated through the National Residency Matching Program (the NRMP), with respect to the percentage of U.S. seniors who ranked our specialty as their only choice, radiology was at the bottom of the list. Just 0.6% were unable to secure a position at the match. And among foreign-educated students so inclined to our specialty 23.1% did not get a position, the lowest percentage among all residencies. Does that mean that even if all training sites fill their classes, quality will decline? Probably. And definitely it will mean that in a few years the characteristics of the practitioners in the specialty will be more cosmopolitan, as an increasing percentage of residents and then fully-fledged radiologists will be foreign-trained, most of them foreign nationals, at least at the time they seek to begin their careers in the U.S.

So now radiology stands alone distinct from its fellow specialties, its erstwhile companions, who for many years travelled together on the same road of applicant esteem. Why the marked change in interest? A partial answer is that reimbursement is down, volume is down, and

the job market is tough. But I think there is also another answer, one informed as much by developments outside medicine as within it. That is the march of technology, once like a pony's trot, and therefore manageable, is now like a stallion's gallop, insistent and uncontrollable.

The impress of algorithmic transformations throughout the economy on the organisation of work and the deployment of personnel seems irresistible in its disruptions. First, many blue collar tasks, with their repetitive exercises, yielded to the efficiencies of the computer. Then some white collar workers became superfluous. Bookkeepers, accountants and now for routine jobs even lawyers have been replaced by programmatic innovations obviating their presence. Above the horizon already is the spectre of transformation of medical recordkeeping, data transfer and most likely image analysis, the latter our bread and butter. In other words radiology is likely to be in the cross hairs. Maybe the effects will be profound, or maybe they will be able to be accommodated, but senior medical students faced with evaluating what they can do for the next forty years, for which they will find enjoyment, intellectual satisfaction and reasonable remuneration, may conclude that radiology's future seems perilous.

Now the claim, or more realistically the hope, may be expressed that such scenarios are temporary and can be explained by a cyclical model of the future. The narrative could be invoked that as in the past something will happen to make prospects brighten again. But just as possible maybe we are witnessing not a cyclical but a structural change, at once portentous and then conclusively permanent. We must recognise this eventuality and try to deal with it. Our once avid and now reluctant medical students are telling us something we must address. Has our forty years of good fortune (1970-2010) prepared us for further good driving ahead or has it become now merely of little sustained preparation for anything but a trip down memory lane? ■





# BIG DATA AND COGNITIVE COMPUTING AT POINT OF CARE

## THE FUTURE OF PRIMARY CARE IN THE GLOBAL HEALTH APPROACH

### Background and Trends

Healthcare services have been under great pressure during recent years, especially when the economic and financial crisis put a remarkable emphasis on sustainability.

It is generally accepted that developed countries' economies are not going to grow until infinity and the capacity of the emergent economies to lead the world economy is not guaranteed.

From another point of view, it seems more accepted that the right to access healthcare services should overcome cultural and economic circumstances and is a "fundamental right".

In this context there appears the concept of "global health", a translation of the concept of globalisation to the healthcare sector. "Our Health is Global Health" stated Alan R. Weil, Editor-in-Chief of *Health Affairs* on September 2014 under the concept of "Advancing Global Health Policy".

A framework of global continuous learning has been established thanks to the improvement in access to relevant information and the ease of networking.

### Convergence of Healthcare System Models

My point is that with the actual situation, and thanks to the probability of more velocity in the adoption of good practice worldwide, a global model of healthcare services is going to emerge. That means that, in the end, converging organisational financing and even coverage models of the worldwide healthcare systems will be developed. Of course, it will take some time due to cultural, political and economic differences among countries.

I am not an expert on the theory of evolution of the species, of organisations or companies, but it seems

clear that the trend is to converge, to benchmark and to take the best lessons home.

Let me share with you a conceptual thought: we agree on applying the concept of evidence in clinical practice known under the acronym EBM (evidence-based medicine). It was very successful some years ago and has been reinforced during recent years thanks to the advances in research methodologies and the possibility of discussing the results worldwide. This means that, if a procedure is based on evidence, it should be practised worldwide in the exact same way. We are not going to accept bad results due to a non evidence-based practice (of course here the role of the patient is clear).

Around any procedure, there is the concept of process, which needs an organisational context (not only) to be practised. I am going to summarise briefly because this is not the objective of this article: if we need to practise EBM, the organisation of the healthcare system should be based on the most cost-effective model which, in the end, is going to be very similar worldwide.

If we agree on these concepts and, returning to the topic of this article, we should accept that there is a better model for efficiency of healthcare systems. It is generally accepted that the model should revolve around primary care with the team model.

At this level, I think we can see the convergence. The team model, born under the Beveridge model (National Health Care Systems), is, among others, present in the primary care centres of the Scandinavian countries, Spain and the UK.

We can also see some changes in this direction in France (Maisons de santé), the Netherlands and Germany, which,

however, follows the Bismarck model (Social Security Systems).

Finally, we can observe the powerful movement of the Medical Home in the US developed under the Affordable Care Act (2010) through the Accountable Care Organisations (ACO) model and based on the successes of Kaiser Permanente, Veterans Health Administration and Health Plans. This movement also changes the payment model from a fee-for-service to a payment for results and value. Bundled payments are moving in the same direction.

### Primary Care (PC)

Let's comment briefly on some aspects of PC which should be taken into consideration:

- Generally speaking, it is most prestigious for a doctor to work as a specialist consultant in a hospital than in PC (it also means, in most cases, much better remuneration);
- There is a lack of experience in working on processes at the PC level;
- The role of nursing in PC is increasing (nurse specialists, nurse practitioners or advanced practice nursing), but we are only at the beginning of these experiences. Additionally, they are not developed globally and, in most cases, not well understood by doctors or healthcare managers;
- One of the outcomes of this situation is that the relationships among PC, hospitals, public health and social services is poor. This lack of coordination goes against the main objective of PC, which is to work around the patient in all the aspects of their pathology(ies) from prevention,



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Figure 1. Population Health Management Dashboard

screening, diagnosis, treatment and follow-up and, if needed, end-of-life care;

- The conceptual and, in some cases, ideological discussion around models and roles on “classic” PC probably has reached a point of no more progress.

**The Computerisation of PC**

In most countries, the level of computerisation in PC is lower than at the hospital level. Most facilities are not interoperable and, even in countries such as Spain where the level is high, the interoperability with hospitals or other levels or services (social care) is weak and the ability to share information between regions or with other European countries is not resolved (in spite of expensive and lengthy EU projects).

In any case, the computerisation of PC has allowed, as a first step, the organisation of clinical information, in most of the cases problem-oriented, which facilitated the exchange of information among PC professionals: physicians, nurses and in, some cases, hospital specialists.

Another problem has to be pointed out: the reliability and the relevance of the information. Indeed, hospitals have a Minimum Data Set (MDS) which, with the help of medical documentarists

or similar professionals, has helped to structure and give reliability to the information shared. This is not the case with PC.

Moreover, the information that is relevant for one specialty (core of knowledge) is not relevant for another specialty and this gap is deeper between PC and specialists.

On the other hand, big advances have been made, with the computerisation of drug prescription and especially with the introduction of e-prescriptions. The quality of prescriptions has improved and the introduction of basic decision support system (DSS) has helped to identify problems (interactions and adverse reactions for example).

The introduction of Pay-for-Performance systems (P4P), based on registered information, has helped to control the cost and quality of prescriptions and the ordered referrals and exams. All these improvements have permitted us to reward or penalise good or poor practice.

Now, we are dealing with the introduction of information systems to help the development of integrated care so as to reach the coordination between healthcare providers and even social care providers. It is not easy because we should apply the concept of processes and reengineering to them to be

successful which is going to take time. (This is not new; the Integrated Delivery Networks already emphasised this point about 30 years ago).

**Big Data and Cognitive Computing**

Now, once again, technology is making impressive advances; concepts like Big data, machine learning and cognitive computing (most of them an evolution of former concepts) are in the healthcare sector.

In the field of oncology, the IBM Watson experience at the Cleveland and Mayo Clinics is giving excellent results.

Some approaches have been implemented for medical homes, most of them acting as tools for decision support systems (DSS) in primary care. This topic is going to evolve depending on quality of data, level of integration and evolution of the process approach.

**Triple Aim and Population Health Management**

To advance in the globally accepted “Triple Aim approach” of the Institute for Healthcare Improvement (IHI) of Boston (better care, better patient experience and lower or at least controlled cost), we have to employ technology.

We also need a framework and the

Population Health Management (PHM) approach seems to be the correct one. PHM strongly emerged recently thanks to the vision - among others - of the Dean Emeritus Stephen Shortell of the Berkeley School of Public Health. The King's Fund has placed PHM only after the step of integrated care and some interesting experiences are arising in the US and the Netherlands.

Only 25% of the concept is attributed to organisation of healthcare and healthcare services, the remaining percentage being attributed to other factors.

If we want to be preventive, predictive and proactive we should take decisions based on more data than that coming from the healthcare system (see Figure 1). The first step is to create a dashboard with integrated indicators coming from public health, social services, environmental health, housing and education. All of this is linked to concepts like smart cities. Owing to this, we are going to personalise interventions, beginning with the stratification of risk and, afterwards, monitoring and reporting the results.

### The “Post-Industrialisation” Era of Healthcare: Vision of the Future

My main point is that to emphasise the vision of the future of healthcare systems, we should begin to work on the evolution of PC towards the PHM approach.

As an example, this post-industrialisation era of healthcare opens the way to the computerisation of the patient healthcare journey around illness.

With actual knowledge, we can envision the future with a healthcare system centred on the patient, who is going to interact with “the systems” and will be assisted by more skilled nurses, fewer PC doctors, other professionals from different sectors depending on the patient/citizen’s needs and input from the specialist, only when necessary.

Of course, evolution towards this model won’t be immediate and some aspects have to be taken into consideration. The most important may be the discussion about the needs of doctors in this future scenario. Dan Hoch, Director of Digital Initiatives Benson-Henry Institute, Massachusetts General Hospital,

stated in his blog on e-patients.net under the title *Too Many Doctors?*: “Much of what I do as a physician could be better done by either machines, or patients themselves” (Hoch 2011). MIT has recently emphasised the same point in the articles “Who will own the robots?” (Rotman 2015) and “How technology is destroying jobs” (Rotman 2013).

### Our Approach

There is no other way. We have to advance, as we have begun to do with a PC group in Barcelona, in three ways: improving processes knowledge (Lean Healthcare), innovation in nursing and also in clinical leadership. The main objective has been to obtain the basic requirements of the future use of big data - cognitive computing in PC and to prepare the basis for the acceptance of evolution.

On the other side, we are beginning a project to apply the PHM concept to ageing and dependency - taking care of aged citizens living at home alone. The wellness of aged people in the cities of developed countries is a big clue to healthcare success. Figure 1 synthesises the conceptual model.

### Conclusion

Concepts around healthcare systems and the needs and hopes of patients/citizens are evolving quickly. They are converging and asking for solutions. To simplify, we have the framework, (PHM), the tools (Big Data and Cognitive Computing) and a model of evaluation (Triple Aim). To advance, we should begin to work in a collaborative model, under a global health approach. ■

### Key Points

- ✓ Healthcare systems conceptual models are converging globally.
- ✓ Primary care should evolve under the framework of Population Health Management.
- ✓ Big data and cognitive computing will be the tools of the post-industrialisation era of healthcare systems.
- ✓ We must address the future needs of doctors and their required skills.



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# BIG DATA FOR HEALTH IN EUROPE



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In 2010, the European Commission proposed the 10-year strategy, Europe 2020, aimed at stimulating economic growth across the EU bloc. An important pillar of the 2020 drive is the creation of the Digital Single Market with the use of Big Data for 'eHealth' and 'mHealth' central to the initiative. The aim is to dramatically improve the quality, efficacy and effectiveness of healthcare and management in the sector across Europe.

By 2020, will Europe be ready? *Health Management.org* spoke to Peteris Zilgalvis Head of Unit, eHealth and Well Being, DG CONNECT at the European Commission about Big Data, security, standardisation and cross-Atlantic collaboration for a healthy Europe.

## The 2020 undertaking is huge. What does a typical day look like at the DG Connect unit?

Broadly speaking, we are following up on the eHealth action plan and the mHealth green paper. Importantly, with the mHealth green paper we are facilitating a code of conduct on privacy in the framework of the data protection directive.

There is also an action being discussed on validation and certification of mHealth apps.

In the area of research we are financing research on the virtual physiological human, telemedicine, mHealth, remote monitoring of chronic diseases, digital health literacy, patient empowerment in general, interoperability and standardisation.

## Protection of health data is an issue on everybody's mind these days. What is the situation vis-à-vis data protection standardisation right now in Europe?

We are hoping to complete the negotiations on the data protection regulation by the end of this year.

Right now there is a directive that sets out the principles of data protection. Areas of sensitive data include health data, but the directive allows the member states to choose the way of implementing it. This has led to some divergence both in the protection of citizens' data and allowing the internal market to work in a very fluid manner. For this reason we are proceeding now with a proposal for regulation which applies directly. What we mean is a citizen should be asked for consent about sensitive data, but that should be done simply and uniformly so as not to cause bureaucratic problems for people and companies wanting to operate across-borders. Once the regulation is adopted this will lead to a more uniform application of the rules.

## Are there any non-negotiable points in the current directive and future regulation on data?

Yes, with a directive, EU states are supposed to achieve the aim that a citizen has the right to rectify incorrect data about themselves.

The regulation will accommodate the different legal and administrative cultures of the member states and will allow a number of ways and means of rectification, but the same provision would be implemented across the bloc. The idea is that we make things simpler by moving to a similar procedure.

## What will EU citizens be seeing 5 to 10 years from now once the regulation is implemented across the bloc?

I think we will see a uniform application of data protection law across the union that will also have benefits for a freer

flow of data when the citizen wants it. Take the person who is spending the winter in southern Spain who goes back home to Sweden or Britain during the summer, who may want cross-border access to their healthcare data.

We'll also see that the market for the mHealth and eHealth applications in both software and hardware will be much more dynamic.

## Has the EU learnt any lessons from the U.S. following serious health data breaches there?

We have a memorandum of understanding on eHealth with the U.S. Department of Health and Human Services. This is a very active partnership, but of course we want to make sure that the European approach is developed.

## What potential is there with use of Big Data in health?

The Big Data potential is huge. If personal data is for public health purposes, you have the possibility of using it in a pseudonymised form without the express consent of the citizen, provided certain safeguards are in place. If it is anonymised data, then this data is very much open for the smart use of both our healthcare authorities and companies which want to offer services that can be of use to providers and citizens.

On the whole, Big Data has the potential to meet citizens' needs and provide jobs and growth.

I think what we are going to see is the way to use all types of data is going to increase and, as it is put together, the possibilities will be endless.

To be honest, I don't think any data will be irrelevant. ■

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# 25 X 25: REDUCING PREMATURE MORTALITY FROM CARDIOVASCULAR DISEASE

THE WORLD HEART FEDERATION'S COMMITMENT: 25% BY THE YEAR 2025



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Cardiovascular disease (CVD), including heart disease and stroke, is the leading cause of death around the world, most surprisingly in low and middle-income countries. CVD alone causes one in three deaths globally, claiming over 17 million lives a year (World Health Organisation, 2015). Yet non-communicable diseases (NCDs) receive less than one per cent of Development Assistance for Health (DAH) funding.

In some cases cardiovascular disease can be prevented by addressing risk factors such as tobacco use, obesity, physical inactivity, high blood pressure, and diabetes. Prevention does work: over the last two decades, deaths due to CVD have declined in high-income countries, due to a combination of prevention and control measures (Mendis et al. 2011), such as tobacco control and promotion of heart-healthy treatment regimes, diet and physical activity. World Heart Day is celebrated every year on 29 September to keep cardiovascular health in people's minds and to raise awareness of what can be done to promote and advance it.

Secondary cardiovascular prevention can be defined as any action aimed at reducing the probability that a heart attack or stroke will occur in patients with known risk factors, such as hardening of the arteries or high blood pressure. Successful secondary prevention of CVD can have a major impact on morbidity and mortality, as well as reducing the economic burden on countries. Interventions include pharmacological treatments (eg aspirin, lipid-lowering drugs, beta-blockers, and/or angiotensin-converting enzyme (ACE) inhibitors), lifestyle modifications

(tobacco cessation, regular physical activity, heart-healthy diet etc.) and effective management of any underlying medical condition.

Secondary prevention interventions, including medications and lifestyle modifications, have been shown to be important in minimising repeat events, as well as being cost-effective (Perk et al. 2012). Despite the proven benefits of secondary prevention, use of relevant medicines for CVD is low worldwide and systematic approaches are needed to improve the long-term use of effective drugs (Yusuf et al. 2011).

In September, 2011 the United Nations (UN) held a meeting on the prevention and control of NCDs, including CVD. This was only the second time in its history that the UN held a summit on a health issue, with the aim of:

- Increasing the political prioritisation of NCDs;

- Recognising NCDs not just as a health issue, but also as a major economic burden and an obstacle to global development and sustainability.

The meeting led to the adoption of a Political Declaration, signed by all UN Member States, which outlines commitments to strengthen prevention and control of NCDs (United Nations, General Assembly, 2011).

One of the first steps following the declaration was the development of the NCD Global Monitoring Framework adopted by the World Health Assembly, the governing body of the World Health Organisation, in 2013. The GMF sets out a series of targets for NCDs and serves as a foundation for action on prevention, control and the strengthening of health systems to address NCDs (World Health Organization, 2013). The overarching objective of the Global Monitoring Framework is a 25 percent relative reduction in overall mortality from cardiovascular disease and other NCDs by 2025.

As a result of continued advocacy and leadership from the World Heart Federation, together with its members and other agencies working on non-communicable diseases (NCDs), in May, 2013, the World Health Organisation passed a comprehensive set of targets and indicators to reduce NCDs by 2025. Member states also endorsed the WHO Global NCD Action Plan 2013–2020 (World Health Organization, 2013), which urged countries to develop comprehensive National Action Plans on NCDs by the end of 2013, a process which has been extended to 2015.

**“CVD, including heart disease and stroke, makes up nearly 50 per cent of all NCD deaths, yet 80 per cent of premature heart disease and stroke is preventable. CVD is no longer just a health issue, but a major economic burden. By 2030, the total global cost of CVD is set to rise from approximately US\$863 billion in 2010 to a staggering US\$1,044 billion. With costs like these, prevention must be a global priority” - Johanna Ralston, Chief Executive Officer World Heart Federation.**

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# CARDIOVASCULAR DISEASE (CVD) IS THE WORLD'S NUMBER ONE KILLER

Responsible for over **17 MILLION** deaths a year. By 2030 this is expected to rise to **23 MILLION**

**WE NEED TO FOCUS ON THOSE MOST AT RISK OF PREMATURE MORTALITY TO HAVE A CHANCE OF REACHING THE 25x25 TARGET. OTHERWISE THERE COULD BE AN UNPRECEDENTED HUMAN AND ECONOMIC IMPACT, WITH LIVES LOST AND A SIGNIFICANT BURDEN ON HEALTH SERVICES**

**THIS NEEDS TO CHANGE**

**CVD IS THE BIGGEST CAUSE OF DEATHS AMONGST ALL NON-COMMUNICABLE DISEASES (NCDs) – ONE THIRD OF GLOBAL DEATHS ARE ATTRIBUTED TO CVD AND IT IS ONE OF THE MOST SIGNIFICANT CAUSES OF PREMATURE MORTALITY**

ISCHEMIC HEART DISEASE AND CEREBROVASCULAR DISEASES WERE THE TOP TWO CAUSES OF GLOBAL DEATHS IN 2010, WITH ISCHEMIC HEART DISEASE THE MOST IMPORTANT CAUSE OF PREMATURE DEATH GLOBALLY

People with cardiovascular disease are at particularly high risk of a CVD event

**HIGH BLOOD PRESSURE AND SMOKING WERE AMONG THE MOST IMPORTANT RISK FACTORS CONTRIBUTING TO THIS GLOBAL DISEASE BURDEN IN 2010**

**CVD PLACES A SIGNIFICANT BURDEN NOT ONLY ON THE INDIVIDUAL, BUT ALSO ON HEALTHCARE SYSTEMS AND ECONOMIES. IN 2010, CVD COST \$863 BILLION GLOBALLY AND BY 2030, CVD COSTS ARE PROJECTED TO RISE BY 22%, TO \$1,044 BILLION**

**THE WORLD HEALTH ORGANISATION (WHO) TARGET OF 25x25 CALLS FOR THE REDUCTION OF PREMATURE MORTALITY FROM NCDs BY 25% BY 2025. THIS MAKES THE SECONDARY PREVENTION OF CVD A PUBLIC HEALTH PRIORITY**

**THE WHO PROVIDES CRUCIAL GLOBAL POLICY GUIDANCE ON NCDs FOR ALL COUNTRIES, WHICH INCLUDES SECONDARY PREVENTION**

**THERE ARE A NUMBER OF BARRIERS AT A NATIONAL POLICY LEVEL PREVENTING THE SUCCESSFUL IMPLEMENTATION OF SECONDARY PREVENTION GUIDELINES**

At the healthcare professional (HCP) level, even where secondary prevention policies are in place, there is often a substantial gap between policy and clinical practice in the uptake of guidelines

#### **BARRIERS INCLUDE:**

- No formal national CVD action plans in place;
- Lack of time-bound targets;
- Limited financial commitments to back targets;
- National and regional health inequities;
- Lack of monitoring or administrative systems to manage disease complexity;
- Reduction in health budgets.

#### **TO IMPROVE HCP IMPLEMENTATION OF GUIDELINES, STRATEGIES COULD INCLUDE**

- Simplify guidelines and use technology to make them more easily available;
- Encourage local opinion leaders to exert influence among peers;
- Better education.

#### **WHAT IS NEEDED TO IMPROVE SECONDARY PREVENTION:**

- A comprehensive approach is needed to improve CVD prevention and achieve the 25x25 target;
- The World Heart Federation (WHF) is leading the development of a CVD Roadmap to address policy and health system barriers and adaptable strategies for a variety of settings;
- Everyone has a part to play in the reduction of CVD and premature mortality at a global and a national level.

## **THE TIME TO ACT IS NOW!**

THE WORLD HEART FEDERATION IS CALLING ON POLICYMAKERS, PROFESSIONAL ORGANISATIONS, HEALTHCARE PROFESSIONALS AND PATIENT ADVOCACY GROUPS TO WORK TOGETHER TO ACT GLOBALLY. NEVER BEFORE HAS THE COMMUNITY BEEN BETTER PLACED TO ACT IN A CO-ORDINATED WAY TO OVERCOME THIS CHALLENGE

[www.championadvocates.org](http://www.championadvocates.org)



**WORLD HEART  
FEDERATION®**

**AstraZeneca** 

The Champion Advocates Programme is supported by an unrestricted educational grant from AstraZeneca

## “WORKING TOGETHER, WE CAN PROLONG THE LIVES OF PEOPLE AROUND THE GLOBE, HELP REDUCE THE FINANCIAL BURDEN OF CVD ON NATIONAL HEALTH SERVICES AND SYSTEMS AND SET THE POLITICAL AGENDA FOR CVD FOR DECADES TO COME”

- JOHANNA RALSTON, CHIEF EXECUTIVE OFFICER WORLD HEART FEDERATION.

This led to the World Heart Federation recognising that achieving the 2025 targets would require a primary focus on cardiovascular disease (CVD), and that all of the targets have a direct impact on CVD. The World Heart Federation has committed to supporting action to reduce premature mortality from CVD by 25 per cent by 2025.

The World Heart Federation is involved in a number of initiatives based on the 25x25 goal. The Champion Advocates Programme was a global initiative established to focus on the secondary prevention of CVD ([www.championadvocates.org](http://www.championadvocates.org)). To achieve this, the World

Heart Federation engaged with practising cardiologists and other healthcare professionals as Champion Advocates, focusing on evidence-based secondary prevention treatment of heart disease and stroke. Champion Advocates were encouraged to support the accelerated implementation of secondary prevention guidelines within hospitals, medical practices and clinics.

The programme also aimed to build awareness of CVD risk factors, and communicate the importance of CVD prevention throughout a person’s life. To achieve this goal, the Emerging Leaders Programme

([www.championadvocates.org/en/emerging-leaders](http://www.championadvocates.org/en/emerging-leaders)) has been created by the World Heart Federation to develop a long-term cadre of experts who collaborate, research and act to reduce premature mortality from CVD globally by at least 25 per cent by 2025. The new Emerging Leaders for 2014-15 met in April, 2015 in Lima and nominations for next year’s Emerging Leaders programme opened in August, 2015.

Finally, the World Heart Federation works to engage with the media to build awareness around heart health, primary and secondary prevention and to help journalists improve reporting of CVD prevention and treatment worldwide. The legacy of the Champion Advocates Programme are the CVD Roadmaps, which focus on the 25x25 targets, with particular emphasis on secondary prevention, tobacco control and management of raised blood pressure. ■

### Key Points

- ✓ Cardiovascular disease (CVD), including heart disease and stroke, is the world’s largest killer, claiming over 17 million lives a year.
- ✓ The Champion Advocates Programme was a World Heart Federation global initiative, aiming to drive progress towards achieving a 25 per cent reduction in premature deaths from cardiovascular disease (CVD) by 2025.
- ✓ The programme aimed to raise the profile of secondary prevention of cardiovascular disease (CVD), including heart attack and stroke.
- ✓ The World Heart Federation is committed to reducing premature mortality from CVD by 25% by 2025, through its 200-member organisations and the broader CVD community.

“The Champion Advocates programme was an important part of the World Heart Federation’s commitment to the World Health Organisation’s (WHO) target of reducing premature deaths from non-communicable diseases by 25 per cent by 2025. It gave us a great platform by which to focus attention on 25x25, through its 200 plus member organisations and the broader CVD community”

Johanna Ralston, Chief Executive Officer, World Heart Federation



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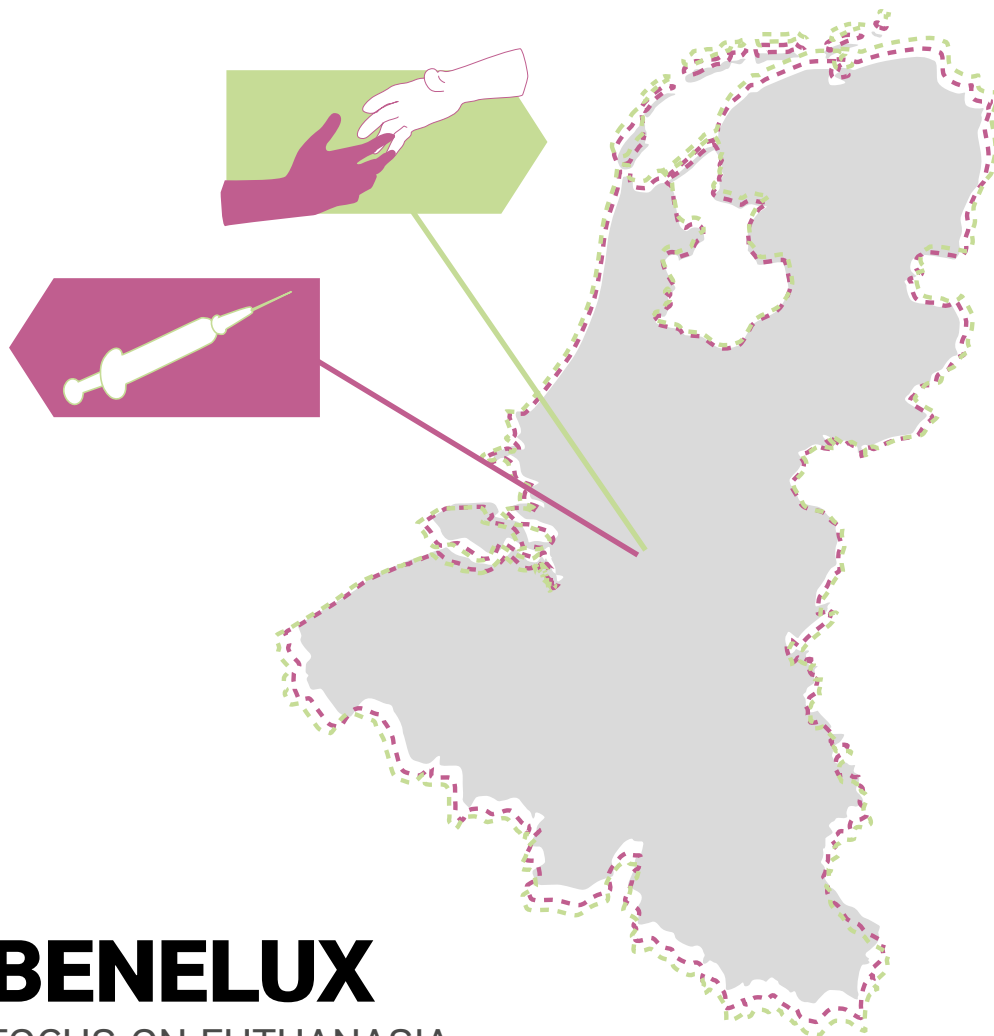
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# BENELUX

## FOCUS ON EUTHANASIA

In Europe, euthanasia, the act of assisting with the death of a person at their express request, is only legal in Belgium, the Netherlands and Luxembourg - the Benelux. This sensitive practice has strong voices both for and against. *HealthManagement.org* spoke to two leading advocates on the euthanasia issue. They shared their views on why they support or oppose this controversial act.

### Opposed

**Dr Kevin Fitzpatrick, OBE has been spokesperson and researcher for Not Dead Yet, UK since 2010 and is the Director of the Euthanasia Prevention Coalition International. This year, he set up anti-euthanasia body Hope, Ireland. Dr. Fitzpatrick has been a paraplegic wheelchair user for more than 40 years.**

I have been treated by the best practitioners over a 42-year stretch. I owe them and respect them enormously. This is in contrast to those few doctors

who, despite any prowess they may have had, I would not let touch me.

Even the best practitioners however, can be surprised that all major disability rights groups oppose legalising assisted suicide/euthanasia. They know (as do we) that some people, disabled people included, come to consider an untimely death seriously. So what should be our response to those patients?

Everyone deserves the best care and treatment, as a human being, regardless of their situation. The question here is: must we legalise assisted suicide/euthanasia so that we can support those in most dire need, as they ought to be supported? I am certain, after years of research, that it is entirely possible to seek the best end-of-life care for every citizen and yet oppose such laws – for reasons of their consequences.

### Complex Issue

Do we need to legalise assisted suicide/euthanasia for reasons of patient choice

and autonomy? Despite the rhetoric employed in the public forum, such laws concern protecting those who provide suicide assistance. Patient choice is an illusion: if the doctor refuses, the patient has no legal recourse. All choice, all responsibility passes into the hands of doctors, most of whom say they do not want it.

Perhaps pain is the issue? Palliative care specialists count  $\pm 2\%$  of all cases with refractory symptoms that are so hard to manage. They have deep sedation, even in the light of double-effect, as an option. So too, withdrawal of futile treatment.

In particularly 'hard cases', end-of-life questions come when medicine says 'We can do no more' (except ease the process of dying). To end a human life is always a terrible thing, even in such dreadful circumstances. When (some) practitioners lose the sense of the awful burden they carry, when ending human life becomes routine, our whole culture,



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not just in medicine, is radically changed. Worse, when laws, are passed and even before, some people argue that 'it is our moral duty' to end those lives.

### People with Disabilities

The problem for us (as disabled people) is that this false moral elevation of assisted suicide/euthanasia affects us most.

We are seen as just plain obvious candidates for elimination. One Belgian government adviser was adamant in a public meeting that their law had been constructed for disabled people who, in his estimation, should want to die given their disability (his example was 'a man with no arms and no legs'). The Supreme Court of Canada has just written into law (February 2015), the first time anywhere in the world, that being disabled is a sufficient reason of itself for a euthanasia death. Our lives are deemed 'not worth living' by those who have no real idea of what living our lives means to us, our spouses, children, wider families, our colleagues, the shopkeeper, the taxi driver and all.

So consider: an otherwise healthy young man approaches his GP to discuss his suicidal ideation. All suicide prevention services (we hope) are brought swiftly to bear; the extreme is 'sectioning' under mental health law. Why then, when a woman, born severely disabled, says "I want to die", is the response "Well, yes - no-one could blame you?" Is that really compassion?

The difference in response is based solely on disability. It is paradigmatically disability discrimination, no matter how well-intentioned, compassionate, or otherwise – and can be compounded by inexperience, exhaustion, management/resource pressures, laziness, coercion, abuse and malevolence. These can appear in families, friends, carers - anyone directly involved in care of the patient.

### Shifting Parameters

Holland, where the rise in the use of terminal sedation is truly alarming, and Belgium both said their laws would be only ever for terminally ill (eg cancer) patients suffering unbearably and with a very short time to live. Now psychiatric patients, disabled neonates, older people with dementia, people 'tired of life', and more, are being euthanised in both countries.

Belgian law has stated from the beginning that what is now called 'existential

suffering' is alone sufficient for a euthanasia death. Now, a young woman with mental health issues, just 24 years old, who thinks 'euthanasia is a nice idea' is having 'fun' planning her own funeral. She has no other pathology and is not terminally ill, but was 'granted' a euthanasia death scheduled for August this year.

The constant refrain is: "We are not like them (Belgium, Holland). We are modelling our law on Oregon." Oregon's own department of health reports show clearly what motivates is 'being a burden on others' (40% in Oregon, 61% in Washington State). Oregon is no paragon: a terminally ill cancer patient with no private health insurance was informed by letter that the state's insurance scheme could not afford their cancer treatment but that the patient qualified for the assisted suicide programme. Also, Oregon law allows no investigation after the death, does not require doctors to be present and heirs may facilitate the suicide. Who would know if the person who died had been coerced or suggestible in their vulnerable condition? Who is not vulnerable when faced with death as their only option?

These are just some of the complexities. Legislating for them all is impossible. It would surely have been done already.

We all need to respond to those who decide to die. But it is entirely consistent to resist moves to legalise euthanasia/assisted suicide when we see the consequences. Ending suffering by ending the life of the sufferer cannot be the blanket response. Fighting for the best palliative and social care and human support for anyone faced with the end of their lives is, I believe, the humane and compassionate response. Then maybe we can leave the easing of suffering of those people in the worst situations to the very best practitioners - the ones I mentioned at the start here.

### Supporting

**Dr. Aycke O.A. Smook is a retired oncologist surgeon and the President of pro-euthanasia body RtDE, Europe. He has been an advocate for the practice since before it was legalised in Holland in 2002.**

"Voluntary euthanasia is not a choice between life and death, it is a choice between two different ways of dying." Jacques Pohier

In 1993, The European branch of the World Federation of Right to Die Societies (WFRtDS founded in 1984) was founded by several end-of-life societies in Europe. Today it is RtDE which has 25 member societies in 16 European countries.

The aim of both organisations is to promote the right to self-determination by individuals facing death. This is based on the Lisbon Oath by the World Medical Association (WMA) which approves the right to die in dignity (1983).

The idea of self-determination at the end of life is not a new phenomenon. In the roaring twenties in Germany, discussion on topics like euthanasia end same sex marriages were a daily affair. In the UK the first Right to Die Society was founded in 1935.

After the Second World War the development of medical progress made it possible to do much more for patients. Many more patients could be cured and kept alive, sometimes against their wish. All over the world nurses in hospitals were confronted with patients with terminal illnesses and the attending physicians, just like Hippocrates, let the vulnerable patient down. Compassionate nurses however took the lead and hastened the death of the suffering patient often with an overdose of morphine or insulin.

### Dutch Definition of Euthanasia

In the Netherlands, euthanasia is understood to mean the termination of life by a doctor at the competent patient's explicit request with the aim of putting an end to unbearable suffering with no prospect of improvement. It includes suicide with the assistance of a doctor. The voluntary nature of the patient's request is crucial; euthanasia may only take place at the explicit request of the patient.

In 2001 the Dutch parliament adopted 'The Termination of Life on request and assisted Suicide Act' that came into effect in April 2002. In Belgium and Luxembourg a similar law was adopted a little later. On the whole, the law on euthanasia in the Benelux is, in effect, the same.

### Criteria

- The request must be voluntary and well-considered;
- The patient's suffering is unbearable and there is, despite the best palliative care, no prospect of improvement;

### Benelux Statistics (2012-2013)

Country	Belgium	Luxembourg	The Netherlands
Total population	11,104,000	530,000	16,759,000
Gross national income per capita (PPP international \$)	40	59,750 (2012)	43
Life expectancy at birth m/f	78/83	80/84	79/83
Probability of dying between 15 and 60 years m/f (per 1,000 population)	98/57	79/50	69/54
Total expenditure on health per capita (Intl \$)	4,526	6,518	5,601
Total expenditure on health as % of GDP	11.2	7.1	12.9

#### Sources

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World Health Organization (2013) The Netherlands Country Statistics [www.who.int/countries/nld/en](http://www.who.int/countries/nld/en)

- The patient is aware of the diagnosis, their situation and the prognosis;
- The patient and the doctor must come to the joint conclusion that there is no other reasonable solution;
- The doctor has to consult at least one independent colleague, who must see the patient in person;
- The doctor must act with medical care and attention in terminating the patient's life or assisting in their suicide;
- The doctor must perform euthanasia only on a patient in his care;
- The doctor must remain with the patient until death occurs;
- The doctor has to report the case to the municipal pathologist, who reports to the regional review committee.

- Refraining from medical treatment on request of the patient;
- Terminal sedation;

Only in Switzerland and the Benelux medical aid in dying is possible in accordance with the legal criteria.

Recently I attended a play in Germany about a young man with terminal disease who needed to go to Switzerland for a dignified death because, in Germany, he could not be helped. His friends did not understand his self-determination. They left him and he had to go alone on his last trip to Switzerland in order to die in dignity.

In the discussion afterwards two forum members, a palliative care doctor and the representative of the archbishop, expressed their disapproval of this situation out of fear that this would lead to 'a slippery slope'.

Opponents always mistrust doctors' integrity and perhaps, do not realise that for a doctor it is not easy to end a patient's life. Also, although patients do not really want to end their lives, they want to end their suffering and the undignified situation there are in.

The majority of the audience at the play said that in Germany, they would like to have the options available in the Benelux. My contribution to the discussion: why are people envious of others who have the power to end their life in dignity?

My personal experience as a surgeon oncologist from 1984 onwards follows the progress in thinking about how to deal with patients in their final stage of life. My motivation to help patients to die has always been their longing for a dignified death. In the beginning of my practice, I performed aid-in-dying behind closed doors, as many

compassionate doctors do around the world. We, the nurse and I, performed euthanasia according to guidelines that later became the standard. Amazingly, pain hardly ever was the reason for the request for euthanasia. It was always the loss of dignity. In many cases the desired death was a better perspective for the patient than enduring the misery of the sickbed.

Since 1985 in the Netherlands we have been able to discuss euthanasia more openly to the benefit of all involved. For the patient, the relatives and the friends a fond farewell has become possible and the process of mourning can begin before death. For proper euthanasia we use at present pentobarbital sodium or propofol with a muscle relaxant. Injecting the lethal drug is, without exception, a very emotional event for all concerned, but fortunately these emotions can now be shared.

It is amazing to see the power of patients in their final stage. In most cases they support the future surviving relatives instead of the other way around.

Two years ago, RtDE acquired an INGO (International Non-Governmental Organisation) status at the Council of Europe after several years of trying. About 140 INGO's meet twice a year in Strasbourg. We, as the board of RtDE are aware that we represent a 'controversial' issue. A lot of NGO's nevertheless support the idea of euthanasia, though it is not their main subject.

In June, the RtDE had its 12th international biannual meeting in Berlin where we discussed, among other matters, the slow progress in Europe. It is three steps forwards and two backwards. ■

The real value of talking about euthanasia does not come from the act itself, but from the ability for the patient and his doctor to speak openly about it.

#### Euthanasia is not:

- Painkilling treatment that may shorten life;
- The administration of lethal drugs to shorten life of persons who cannot express their will such as severely defective new-born babies, incompetent patients and persons in a long-term coma without a living will;
- Abstaining from, or non-initiating life-prolonging treatment that is medically futile or is rejected by the patient;



“...one single thing escapes fate: faith and wisdom”



## PROF. GENEVIÈVE A. DERUMEAUX

CHAIRPERSON, EUROPEAN SOCIETY OF CARDIOLOGY CONGRESS, 2014-2016

Dr. Geneviève Derumeaux is Professor and Head of the Department of Echocardiography, Louis Pradel University Hospital, Lyon, France. She pioneered tissue Doppler imaging and it is her goal to create a subspecialty of noninvasive imaging.

### 1. What are your key areas of interest and research?

I pioneered the assessment of the myocardial function using new techniques that have become part of the cardiac evaluation. Premature ageing is now my area of interest in the context of cardiometabolic disorders. I am now in a translational field, using echocardiography in ageing to tackle problems related to the nature of the heart.

### 2. What are the major challenges in your field?

The major challenge is to integrate new concepts into the clinical area. When you are working on a topic that is new, you need to prove that it is useful. Through my research, the concept of bio-diagnostics has to be translated into clinical practice.

### 3. What is your top management tip?

My tip is integrating people. Integrate people, while both trying to leave them specific space to develop their own career, and helping them cross-collaborate and cross-communicate.

### 4. What would you single out as a career highlight?

My current highlight is running my department, which integrates cardiologists, biologists, people working on cardiac disease and metabolic disorders. We develop a translational programme, aiming to provide the groundwork for tackling major ageing cardiac disease. As this goes beyond echocardiography and ageing, it needs all the integration of all other departments and results in this innovative translational research programme at my current university, Université Paris-Est Créteil.

### 5. If you had not chosen this career path what would you have become?

A pilot.

### 6. What are your personal interests outside work?

Reading, listening to opera music, horse riding, tennis and swimming.

### 7. Do you have a favourite quote?

“Wherever man will inevitably reach, and whatever happens to him, one single thing escapes fate: faith and wisdom” (Søren Kierkegaard).



“Understand stakeholders’ needs and strategies – sometimes before they are aware of them themselves.”



## MORTEN ELBÆK PETERSEN

CEO, SUNDHED.DK

Morten Elbæk Petersen is the CEO of the innovative Danish public health portal sundhed.dk. Launched in 2002 for citizens and health professionals and the largest patient portal in Europe, the site won Petersen the HIMSS Europe eHealth Leadership Award this year. Today, twenty per cent of the Danish population uses the portal every month and use is growing.

### 1. What are your key areas of interest and research?

One joint healthcare system with the patient in focus. I am driven by a desire to modernise and improve the healthcare system through healthcare IT, sharing of quality data and joint infrastructure. I am very interested in implementing eHealth in the public healthcare system to get the most out of a budget by cutting administrative obstacles, involving the patient and connecting the entire healthcare system across sectors, professions and cultures.

### 2. What are the major challenges in your field?

A culture of trust is essential for openly accessible medical records. Several recent studies and surveys show that Denmark is a very trusting nation and the population has a very high level of confidence in the public sector. However, a small group of healthcare professionals has recently set an agenda questioning the safety and transparency of personal healthcare data management. It’s essential to protect and guard the culture of trust. Though we do welcome discussion and criticism, it’s also a challenge.

### 3. What is your top management tip?

Understand stakeholders’ needs and strategies – sometimes before they are aware of them themselves.

### 4. What would you single out as a career highlight?

Starting and building up a successful national health portal for both citizens and healthcare professionals that makes a difference.

### 5. If you had not chosen this career path what do you think you would have become?

A researcher in the social sciences developing new methods in measuring health.

### 6. What are your personal interests outside of work?

Old French cars (Citroën DS), running and of course, my family and dogs.

### 7. Your favourite quote?

“Nobody says anything original - it’s always a quote”.



# Endspurt Krankenhausreform Der 38. Deutsche Krankenhaustag im Überblick

## Montag 16.11.2015

### Auftaktveranstaltung

Reform 2015 - vom Patienten her gedacht?

10.00 - 12.00 Uhr



Hermann Gröhe, PMF



Prof. Dr. Hans-Fred Weber



Thomas Reutemann, Landrat

### Düsseldorf 16.-19.11.2015

CCD-OST, MESSEGELEND  
DÜSSELDORF

„Reform 2015 -  
Vom Patienten her  
gedacht?“

### G-DRG-System 2016

Informationsveranstaltung der  
Deutschen Krankenhausgesellschaft  
13.00 - 16.30 Uhr



Dr. Frank Helwig



Ferdinand Rau



## Dienstag 17.11.2015

### BDI-Symposium

Was ist (messbare) Qualität in der Medizin?

10.00 - 13.00 Uhr



PD Dr. Michael A. Weber



Prof. Dr. Susanne Schwanen

### Innovationsschub Telemedizin

10.00 - 12.00 Uhr



Wolfgang Pflüger



Tilmann Günther

### Krankenhaus-Träger-Forum:

Teil I  
Kernkompetenz Qualität  
10.30 - 12.00 Uhr



Dipl.-Volker Georg Baum



Dr. Christof Velt

### Krankenhaus-Träger-Forum:

Teil II  
Wem hilft der Strukturfonds?  
13.00 - 14.30 Uhr



Dr. Stefan Metzner



Dr. Ralf Kösters

## Mittwoch 18.11.2015

### Entscheiderfabrik

„Unternehmenserfolg durch  
optimalen IT-Einsatz“  
14.00 - 17.00 Uhr



Peter Lübbes



Dr. Pierre-Michael Hefer

### P.E.G.

Krankenhaus-Einkauf und die  
digitale Revolution  
14.30 - 17.00 Uhr



A.J. Schmitt



Prof. Dr. Dr. Wilfried von Ziff

### Mitgliederversammlung VKD

17.00 - 18.30 Uhr



Gabriele Künzler

### BMVZ

Veränderungen in der ambulanten  
Krankenhauswelt  
10.00 - 13.00 Uhr



Susanne Müller



Dr. Bernd Klippel

### Ambulante spezial- fachärztliche Versorgung

10.00 - 12.00 Uhr



Prof. Dr. Hans-Fred Weber



Dr. Regina Klauke-Franck

### Forum „Pflege im Krankenhaus“

- Empowerment von Patienten
- Pflege von Morgen im Krankenhaus
- Versorgungskontinuität sichern

10.00 - 14.30 Uhr



Franz Wagner



Dr. Sabine Beringer



Ulrike Döring

### VKD-Forum:

Management im Risiko

14.00 - 17.00 Uhr



Dr. Josef Döllings



Dr. Ralf-Michael Skovitz

### Vortragsveranstaltung AKG

Landschaftsarchitektur und  
Gesundheit

14.00 - 18.00 Uhr



Dipl.-Ing. Christian Pelster



Prof. Dipl.-Ing. Linus Rehrich

## Donnerstag 19.11.2015

### DVKC

Update - Controlling

15.00 - 17.30 Uhr



Prof. Dr. Björn Müller



Kai Tyborski

### VLK-Forum

Die Generationenfreundliche Klinik

18.00 - 20.00 Uhr



Prof. Dr. Christiane Schmidt, MPH



Prof. Dr. Dr. Martin Bauer, MPH

### 3rd Joint European Hospital Conference

Patientenorientierte Krankenhausversorgung

10.00 - 16.15 Uhr



Dr. Sara Pagani Ferreri



Gerry O'Dwyer



Dr. João de Deus

### Entscheiderfabrik

Wettbewerb um den Start Up und  
Young Professional Preis

10.00 - 12.00 Uhr



Peter Anckel