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Sustainability

The European Health Management Association (EHMA) is a non-profit membership organisation open to all those committed to improving health and healthcare. Our focus is on health management capacity and capabilities and supporting the successful implementation of health policy and practice, so as to make a real difference to the lives of Europe's citizens, patients and communities.

HealthManagement.org shares many common objectives with EHMA and, because of this, we have signed a collaboration agreement to work jointly for better healthcare, particularly given the pressure to continue to deliver quality care in the face of an increasingly elderly population, budget cuts and a move towards value-based care.

'Sustainability' has become a much-used catchphrase in the sector; yet it resonates on a day-to-day practical level from the hospital ward to the boardroom. A strategic awareness and proactive stance on practices that lead to sustainable healthcare are essential across the sector.

Biologist Charles Darwin said it was neither the strongest nor the most intelligent that survives but those who best adapt to change. Indeed, adapting to the swiftly changing healthcare environment is critical for stakeholders to support the intricate network of the care continuum and deliver on best patient outcomes.

The final issue of 2017, HealthManagement.org puts the question of sustainability in healthcare under the microscope – and no matter is too big or too small.

Simona Agger Ganassi of the European Health Property Network and Gaynor Whyles, heading JERA Consulting in the UK offer insights into processes and solutions for innovative healthcare procurement while Eileen O'Leary from the Institute of Technology in Ireland looks at how hospitals can reduce costly food waste.

Andrew Spence examines how a new technologically-advanced hospital in Australia has been built with energy and workflow sustainability in mind and Emily Farrow of the Centre for Sustainable Healthcare in the UK focuses on how education is the bedrock of thinking – and acting - sustainably.

The patient perspective is also central to a healthcare sustainability as Sinead Hewson of the European Institute of Women's Health in Ireland explains in her fascinating study on the approach to gender medicine.

In an in-depth report, healthcare experts explain why the issue of burnout amongst cardiologists needs to be addressed now, and not later, in order to maintain a sustainable workforce.

In addition to Sustainability, latest winning practices on crisis management, interdisciplinary teamwork and management of violence are featured as well as radiological interventions, and the importance of staff wellbeing. The radiologist Dr. Marcello Orsi gives an insightful review of the latest Hologic installation in a local hospital in Italy. Biochemist professor, Giuseppe Lippi, outlines the positives and drawbacks of Health Technology Assessment in laboratory medicine, while Harvard Medical School professor, Bettina Siewert describes how to build a new culture of safety within healthcare.

EHMA is excited to work closely with HealthManagement and all its partner organisations to ensure that the highest quality healthcare is available to all.

Enjoy reading this issue.

Usman Khan
Executive Director
EHMA

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What Do You Think?

What are the sustainability issues on your mind? How is risk management approached in your hospital? Do you have a workable plan for your staffing future? Get in touch about your experience, case studies and opinions on the healthcare management topics that drive you and enjoy the benefits of exposure to our readership of top-level healthcare professionals. As a leading digital and print publication on healthcare management and leadership, there are many ways to share your expertise and join our faculty of highly-esteemed contributors. Contact us on **edito@healthmanagement**.org.

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Knowledge and passion

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Chris McCahan: EXEC editorial board member

Introducing a global healthcare financing perspective

Meet HealthManagement.org's latest board member for EXEC and find out what he plans to bring to readers.

Chris McCahan

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What are your key areas of interest and research?

My professional interests lie in emerging markets healthcare financing. As the Global Lead for Healthcare at International Finance Corporation (IFC), I support a broader team responsible for a $2bln healthcare investment portfolio, across health services, pharma, and medtech. Our objective is to help achieve Universal Health Coverage by expanding access to quality, affordable healthcare. We achieve this through both advisory and investment support to private sector healthcare groups in emerging markets.

What are the major challenges in your field?

The challenges vary by region and country, but IFC's biggest value addition is in the most challenging and poorest countries. In those settings, three of the biggest challenges for private sector healthcare development are:

1. Lack of skilled workers. Of course, this pertains to nurses, doctors and other allied health workers, but also there is a dearth of healthcare management professionals with the skills needed to drive sustainable health businesses;

2. Lack of proven and scalable business models. Often in nascent health markets it's difficult to find investable opportunities. We at IFC are well positioned to help "create" these opportunities by bringing different tools to foster growth and address constraints both at a company level and the country level (e.g. by working to improve regulatory environments);

3. Lack of quality. Healthcare service providers in these markets often lack the prerequisite quality for us to feel comfortable investing in them. Here too we can bring a lot of value by helping companies with their clinical governance, patient safety and quality processes.

What is your top management tip?

I very much believe that often the greatest opportunities for improvement in an organisation come down to very simple, fundamental things such as fostering better communication, setting clear goals and objectives, and ensuring room for creativity.

If you had not chosen this career path what do you think you would have become?

I always had a secret interest in filmmaking. I think it would have been an interesting, and quite different, career pursuit.

> 66 I BELIEVE THAT THE GREATEST OPPORTUNITIES FOR IMPROVEMENT IN AN ORGANISATION COME DOWN TO FOSTERING BETTER COMMUNICATION, SETTING CLEAR GOALS AND OBJECTIVES, AND ENSURING ROOM FOR CREATIVITY 99

What are your personal interests outside of work?

I very much enjoy down time with my family and am perfectly comfortable lying on the beach with a book or pretty much doing nothing. However, I am also a painter, and enjoy a myriad of sports.

Your favourite quote?

It is not the strongest of the species that survives, nor the most intelligent, but the one most responsive to change. Charles Darwin

As a new Editorial Board member, what do you hope to contribute to HealthManagement.org?

I am quite excited to join the editorial board of HealthManagement.org. I hope to bring an emerging markets investor perspective to the content. Through my role, I see a lot of different and innovative healthcare business models, trends in private sector delivery and financing, new technology developments, and approaches to regulatory issues. I feel there is a lot to learn from what is going on in different parts of the world in healthcare, and I hope to bring some of this to light to HealthManagement.org's readership. ■

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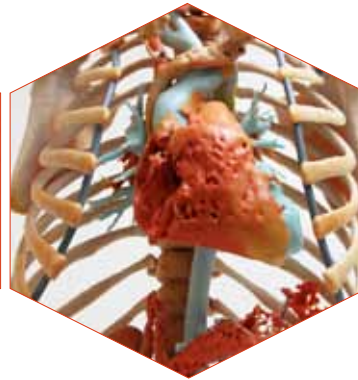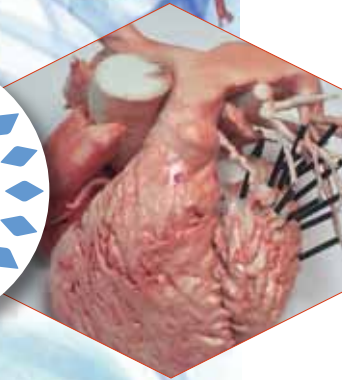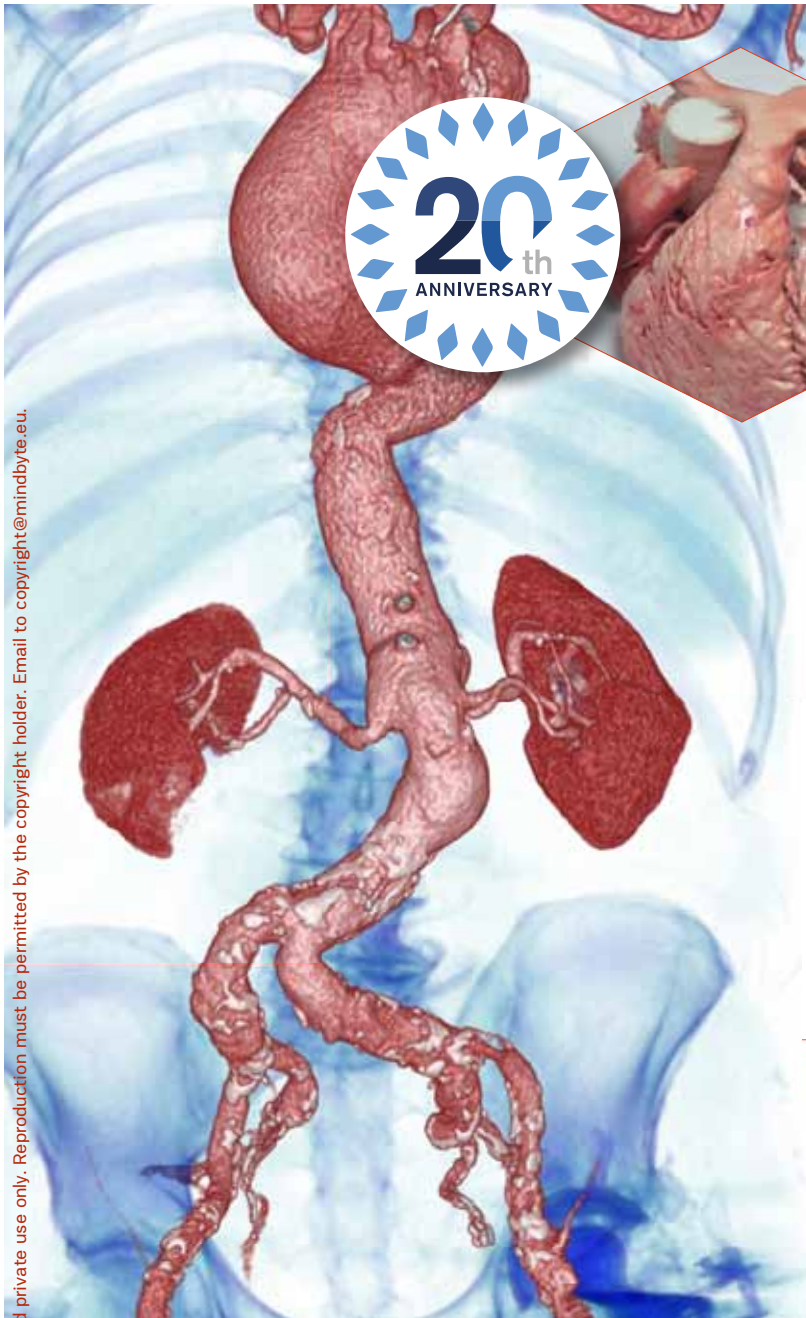
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Digital transformation and the subconscious

Shaping the minds of organisations

Professor Werner Leodolter speaks to HealthManagement.org about managing the technology-induced change in decision making in organisations detailed in his new book.

Werner Leodolter

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The digital transformation is changing the subconscious minds of organisations. Humans increasingly collaborate with robots, artificial intelligence (AI) and machine learning thus forming hybrid intelligencies, which have to be integrated in organisations.

In your book, why do you refer to the 'subconscious mind' of an organisation? Isn't the subconscious something specifically human?

It is, in fact, 'human specific'. Let me give you an example. When I first learned to drive, I was fully and consciously concentrated on driving - on every gear change, use of the indicator, etc. After a relatively short period of time and frequent driving it started to become automatic and I could turn my attention to other things like talking with my passenger or listening to the radio. My subconscious mind partly took over.

Today we have all sorts of options and assistance available in our cars: automatic drive, car phone, voice recognition, navigation system, parking sensors and proximity warning for instance.

What is happening in organisations?

In organisations more and more decisions are being assisted with decision support systems or are even automated. Collaboration between man and machine is increasing. Hybrid intelligencies are emerging. It's like when you drive a car as a human. You drive with less effort having delegated a lot of action patterns to your subconscious mind and using the technology of assistive systems.

But when driving in a highly-assisted mode there is one crucial question: Will I also be able to react properly in specific maybe dangerous situations? Will I even recognise them?

There is the same question in an organisation:

Will I recognise critical developments early enough? How will my organisation deal with uncertainty and unforseeable developments when it is used to automatic decision-taking by algorithms which are good in routine situations?

So it is all about how decisions are taken. Mental and algorithmic models as parts of the subconscious mind of your organisation significantly influence and drive the decisions taken.

What is it that changes the way decisions are taken in organisations?

Technology changes the cognitive process of individuals as well as of organisations. Cognitive computing already directly adresses cognitve processes which were a privilege of humans until now.

Which elements of the cognitive process are changed?

Perception is changed by virtual reality, augmented reality, mixed reality, social media, ubiquitous sensors and drones.

Analysis and interpretation are changed by pattern recognition, realtime analysis and several forms of AI.

Decision support and automated decisions are enabled by AI too

What is an example for changed perception and decision making of organisations?

Here is an example from healthcare:

Perception: Email-visit, telemonitoring weight, glucose level, blood pressure, pacemaker etc. change the perception and the view of a hospital as organisation towards the patient.

Decision: The decision can be suggested that everything is ok or there is action required but there is no need to come to the hospital. For example, you

just have to change the dose of medication or you immediately send emergency transport to bring a patient to the hospital.

Here is another example from industry:

Perception: Sensors on the gears and motors of a rolling mill are sensing vibrations, noise, temperature etc. following a certain load situation depending on the parameters of the dimensions and steel qualities that are being rolled. The organisation and its systems thus perceive differently and when the patterns change this might indicate upcoming trouble.

Better decision: The systems tell you, when you have to change bearings for maintenance reasons etc.

> ❝ LET US BE POSITIVE:
> AI WILL MAKE HUMAN INTELLIGENCE
> MORE VALUABLE THAN EVER ❞

So what is the subconscious mind of organisations?

The subconscious mind of an organisation serves as metaphor for the socio-technical construct of an organisation. It consists of:

- Technical infrastructure (which enables the organisation of the subconscious and conscious behaviour driven by digital transformation)
- Structures and processes of an organisation (formal and informal rules)
- Values, attitudes and strategies.

It provides a framework to promote and leverage digital transformation in healthcare, in industry and nearly all other kinds of businesses.

What is the benefit of applying this metaphor?

Routinely, in business and private life, we always have to (at least should) be aware of how humans think with all the pitfalls but also all the wonderful human abilities such as intuition, creativity, innovation, empathy and common sense. Simply apply this to your organisation consisting of humans and their behaviour. But the organisational behaviour is also affected by machines, infrastructure, algorithms and AI for instance.

This helps you and encourages you to detect bias in data used by algorithms - especially as data is always past tense. It helps you to look at it more critically.

It helps you as a manager to get a clearer view when you have to intervene in automatic decision making in subordinated Organisational Units (OU´s) or in hybrid intelligences or in automated decision making by algorithms.
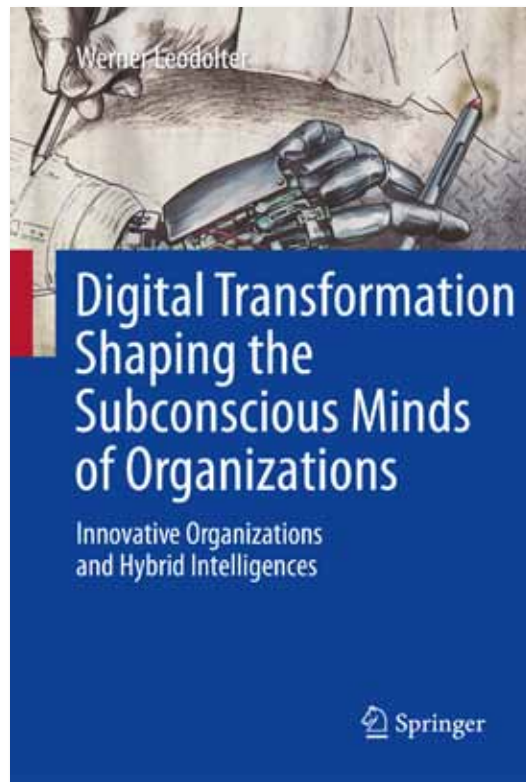
It helps you in how to keep governance - how to stay in the driver's seat as a manager or in general as a human being while using assistance provided by technology in a sensible way.

How can the subconscious mind of an organisation be shaped?

There are many ways to do this. Provide elearning, microlearning and simulation tools so they keep you in shape to assess situations on your own with all your human repertoire. Drill your staff in systems thinking and consistent argumentation. Ensure responsibility and accountability from the individual employee. There is a great deal to be done for developing a culture concerning responsibility when you establish or shape collaboration between humans and between humans and machines.

I am convinced that only flat organisations, or organsations with minimal levels of middle management, will emerge as successful on the journey through the digital transformation. There are some more guiding principles on this provided and exemplified in my book.

Where will the digital transformation lead us?

We simply do not know where digital transformation will lead us. Uncertainty is not vanishing from earth because we have big data and prediction algorithms.

Look at political developments stumbling from crisis to crisis. I know a wonderful picture with a sad-looking dog, saying: "When I knew all the answers they changed all the questions". That is where we are. Technologies in many fields are in the dynamic phase of their exponential developments – and all at once it seems.

So we need new models of thinking and scrutinising decision proposals. We have to organise ourselves anew to be able to cope with the challenges posed by the exponential developments in AI etc. The metaphor of the subconscious mind of organisations will help.

> ❝ UNCERTAINTY IS NOT VANISHING FROM EARTH BECAUSE WE HAVE BIG DATA AND PREDICTION ALGORITHMS ❞

What will the role of humans be in hybrid intelligences?

In the closer collaboration between man and machines, we see with all kinds of assistive systems, chatbots and decision support systems, Robots moving among people in warehouses and in hospital wards. From this ever closer collaboration, hybrid intelligences will emerge. This will challenge us to stay in the driver's seat in important issues. Machine learning detects patterns of our decisions and actions and will incorporate this in its decision proposals and thus will increase the pressure on us as humans. Where will we want to rely on assistive AI? Where will we keep the freedom to stay on our own? What will be the role of humans in future?

The basic principle should be: People do not serve structures but organisations, technology and structures serve people.

What will the role of humans be in future in general?

I am convinced that repetitive tasks will be taken over by AI. Core human abilities like imagination, ingenuity, creativity, adaptability, responsibility, common sense, ethical capacity, to feel and communicate empathy and trust, the ability to dream and love will not be emulated in the next two decades. Let us be positive: AI will make human Intelligence more valuable than ever.

How can I get started in my organisation with shaping its subconscious mind?

First: Apply this metaphor of the subconscious as model of thinking and establish cybernetic and systems thinking by challenging your employees to argue their proposals in this way. Then, with this in mind, analyse perception and decision making now and in future, envisioning the upcoming AI and decision tools. Additionally, analyse how your organisation is embedded in business and in society and what is going to change. Finally: look for a trigger to get started like an adverse event or an obvious need to change your business model.

In my book "Digital Transformation Shaping the Subconscious Minds of Organizations - Innovative Organizations and Hybrid intelligences" you find some helpful guiding principles supported by lucid stories.

Let us make sure that - metaphorically speaking - we "stay in the driver's seat" and we have established the governance to at least set the direction and to intervene when partly autonomous driving takes us the wrong way. ∎

KEY POINTS

✓ Digital transformation is changing the subconscious minds of organisations

✓ Collaboration between man and machine is increasingly forming hybrid intelligences

✓ Technology is changing the cognitive process of individuals and organisations

✓ Horizontal organisations will emerge as successful in digital transformation

✓ We don't know where digital transformation will lead us

✓ To shape the subconscious mind of an organisation, provide e-learning, microlearning and simulation tools, drill staff in systems thinking and ensure responsibility from individuals.

Werner Leodolter is CIO of KAGes, a healthcare company with 17,000 employees in Austria and Professor for Applied Management in Healthcare at the University of Graz. He is also author of two books about digital transformation and conference speaker. For five years he lead KAGes as CEO through a major organisational transition phase.

For information on "Digital Transformation Shaping the Subconscious Minds of Organizations – Innovative Organizations and Hybrid Intelligences" go to: springer.com/in/book/9783319536170

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12:45 Dr. T. Binder (Vienna, Austria) – **Clinical cases using advanced LV function analysis**

13:05 Dr. H.J. Nesser (Linz, Austria) – **Clinical cases using 3D WMT in daily practice**

13:25 Dr. M. Sitges (Barcelona, Spain) – **2D and 3D wall motion tracking in sport-medicine**

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Top management tips

Management ideas from leading healthcare professionals

HealthManagement.org has compiled this year's top management tips from some of our leading contributors for leadership ideas and inspiration. They reply to the question: What is your top management tip?

"Be passionate about what you stand for and humble in leading people"
Andre Heinz
Global Head of Human Resources - Siemens Healthineers

"Remain authentic; see through the noise; understand; make bold informed choices"
Sinead Hewson
Board member European Institute of Women's Health (Entrepreneur) - European Institute of Women's Health

"Listen well"
Karl Brauner
Deputy Director-General - World Trade Organization

"Do not underestimate the effort, costs and time that are necessary to properly train the users of any OAI system, and have these users become committed in making the best use of the system and in contributing to its continuous improvement. In short, consider the most important human factor, which are the human actors themselves."
Federico Cabitza
Assistant Professor - University of Milano-Bicocca & IRCCS IO Galeazzi, Milano

"Management is different from leadership! Leadership - have a vision that is shared with your team and lead from the front."
Andy Rogers
President British Institute of Radiology (2016-2018)

"Be true to yourself and always put values before interests."
João Bocas
Digital Health Influencer & CEO at Digital Salutem

"Have Emotional Intelligence."
Miguel Cabrer
CIO - Son Espases University Hospital

"When having to prioritise tasks follow Eisenhower's matrix. Create an imaginary 4 field table, mapping urgent / non-urgent against important and not-important."
Christoph Thuemmler
Professor of eHealth - Edinburgh Napier University, School of Computing

"Don't forget your personal life, because although ambition is important there is always a personal life behind. What I know from my own past is that if you get more and more rigid because people don't accept what you are doing, you may be too hard. Therefore you need to also culture your soft skills, to be human when you are also a pioneer. As a manager, you need to keep an eye on your PhD students. They can have difficult times when things don't work like they want so you have to keep an open eye otherwise people will disappear and become frustrated."
Angela Maas
Professor of Women's Cardiac Health Department of Cardiology - Radboud University Medical Center Nijmegen, the Netherlands

"Focus on execution. It is all that stands between you and success"
Helmut Schuehsler
Chairman & CEO - TVM Capital Healthcare Partners Ltd.

"Listen to the junior member of staff. Let the junior speak."
Edewede Oriwoh
Independent Cyber-physical Security Researcher

"Data is here so search for its insights. Don't focus on the problem, look for the solution. To do this we need to have a Hackers' Spirit and the pride to overcome challenges."
Ignacio Martinez Soriano
Data Scientist

"Treat people with respect, build trust, demonstrate caring, exude integrity, display dependability and character."
Thanh Tran
CEO – Zoeticx

"Lead through example and follow up"
Abelardo Vidaurreta
MD, Head of Innovation – salauno

Innovative procurement

Leading to sustainable healthcare solutions

Three pilot studies show how an innovative approach to healthcare procurement can lead to solutions.

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Simona Agger Ganassi

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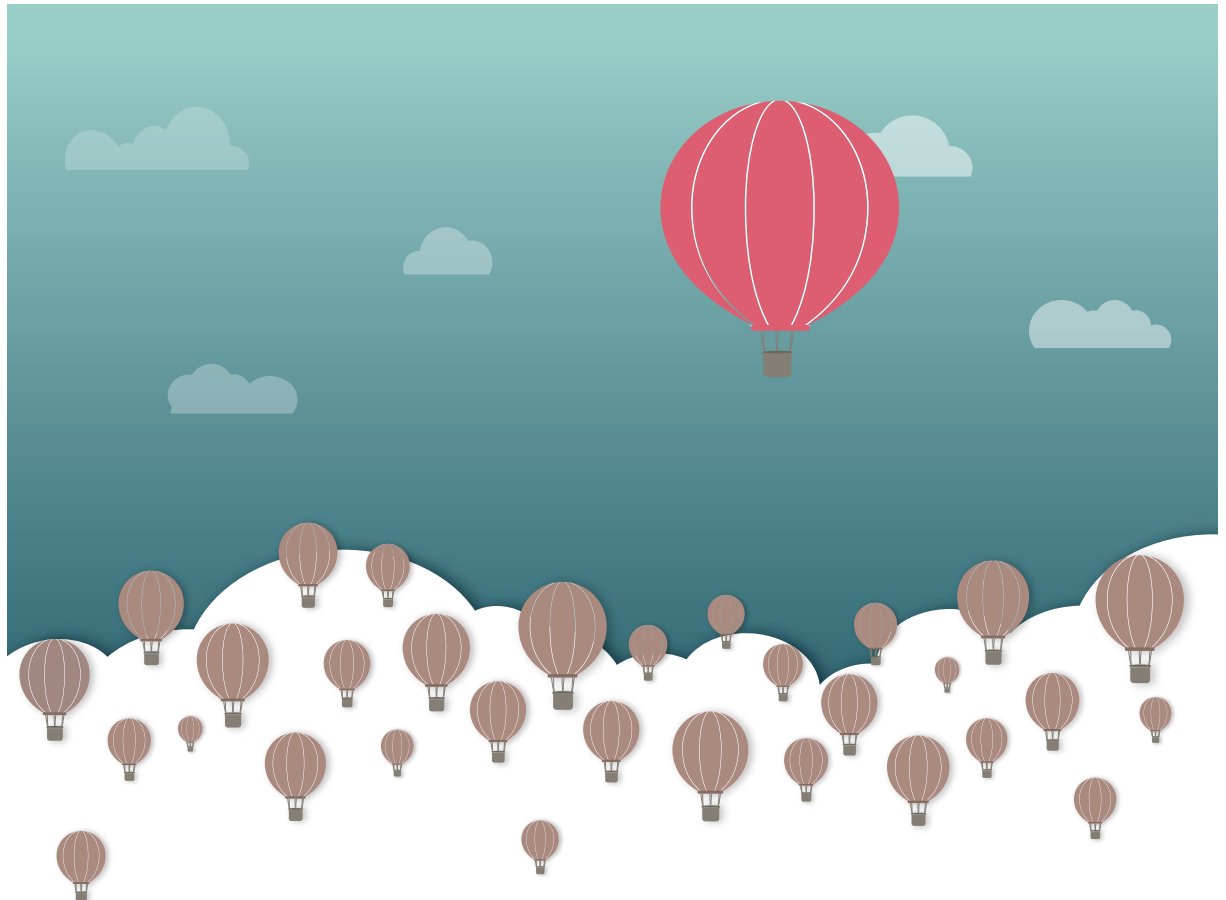
For many years, the European Community has been promoting innovation as a fundamental way of enhancing the development of the European Union (EU) and its role in the international arena. Antonio Tajani, President of the European Parliament and former European Commissioner for Industry and Entrepreneurship, has stated: "European public authorities all have the responsibility to favour innovation when producing and consuming goods and services".

In spite of the active support by the European Community (EC), innovation procurement remains a concept that is not sufficiently understood and, consequently, not exploited in its potential for addressing problems and maximising opportunities.

This article concerns specifically the Public Procurement of Innovation (PPI) in Healthcare. However it can be considered a valid example for any other sector of public functions and services. In fact, compared with all the other public sectors, e.g. public administration, education or justice, the health sector is among the largest contributor to the total amount of public procurement in the EU - estimated by the European Commission at €2 trillion per year.

Therefore it should be considered a potential leader in stimulating innovation through procurement.

This article draws from the experience of a group of hospitals, that undertook to test the Forward Commitment Procurement (FCP) approach to innovation procurement in the EC co-financed project 'EcoQUIP', and to demonstrate how improvements in the efficiency, quality and environmental sustainability of healthcare could be achieved. These pilot projects were undertaken in a diverse group of healthcare organisations across Europe, in Italy, the Netherlands, Poland, UK, as 'action learning' projects with the support of expert partners in innovation procurement.

> ❝ INNOVATION PROCUREMENT IS A CONCEPT THAT IS NOT SUFFICIENTLY UNDERSTOOD OR EXPLOITED ❞

The challenge: delivering better healthcare with fewer resources

EcoQUIP launched with austerity measures in full swing across Europe and when the healthcare sector was already facing the pressures of an aging population and increasing expectations and demands for care services, as well as enormous cost pressures.

At such times, hard-pressed budget holders were inclined to see environmental sustainability as a costly luxury and innovation an unnecessary risk. Still today, many EU Member States (MS) apply policies of so-called 'spending reviews'. Cuts, however, are not the answer.

EcoQUIP took an alternative path: to work with hospitals and their suppliers to deliver better outcomes, sustainability and cost efficiencies. The tool was 'innovation procurement'.

"Collectively the pilots carried out by the partners of EcoQUIP demonstrate that better quality, more sustainable services can be provided at lower cost, if procurements provide time and space for innovation," said Dr Jonathan Frost OBE, EcoQUIP Steering Committee Chairman.

What is innovation procurement?

A detailed description of the FCP methodology is not the aim of this article. For this we can refer to the many sources available. We will rather focus here on the outcomes and the experience within the case examples, starting by setting out some 'key principles'.

The three stages of innovation procurement are 1) know what you need and define it in terms of outcomes, not solutions, 2) tell the marketplace in ways that convince them you are a credible customer, 3) finally ensure that your procurement process allows innovative solutions to compete with traditional solutions.

Identification of a credible unmet need

The process starts with an identification of a credible and genuine need. This is often referred to as 'the commissioning phase'. In innovation procurement stakeholder engagement, from the lower service operators, to top management, is seen as vital to understanding the real unmet needs of the staff, patients and organisation as a whole, ensuring also that the senior management are fully supportive. The identification stage provides a firm foundation for the innovation procurement, yet it is often the stage that is rushed to 'get tenders out in time'.

Market engagement

The market engagement phase is a 'pre-procurement' activity, i.e. it takes place before a formal tendering begins. Its purpose is to assess the appetite, capacity and capability of the market to respond to the customer's requirements and gives suppliers early warning of forthcoming tenders. It is never used to assess or evaluate suppliers. Successful market engagement requires a pro-active approach on the part of the procurers and for suppliers to believe that the procurers are serious and committed. It helps to determine the procurement strategy that is most likely to deliver the desired outcomes. It is a crucial phase to break down barriers and overcome what is often termed "the Buyer-Supplier paradox".

EcoQUIP worked to resolve this buyer-supplier impasse by enabling the healthcare customers to accurately identify their unmet needs and then engage with suppliers in a way that stimulates a response. For suppliers it offers an opportunity to be creative and distinguish themselves and their products.

Outcome based specifications: The potential for finding an innovative solution is greatest when customers specify what they want in terms of the desired outcomes that are required from goods or services, rather than a detailed technical specification. The dialogue of the market engagement will not, as traditionally, focus on the specific functional

characteristics of a product or a service, but on the needed results not satisfied by existing goods or services and the potential for the supply chain to innovate and respond with new alternatives.

Pro-innovation tendering

Having clearly identified needs, engaged the supply chain, the next step is to ensure that the tendering process is designed to support and enable innovative solutions to be presented and compete on equal terms. Above all, this means adopting non-price based award criteria, i.e. evaluating offers on 'value', their total cost of ownership, and not simply 'price'.

In this regard it needs to be stressed that the EC Directive 2014/24/EU (Eurolex 2017) on public procurement specifically supports innovation. However, barriers remain in many MSs. Innovation procurement requires a new approach to procurement and tendering and many remain unaware or lack the know how to confidently adopt new practices. For this to change, senior management need to offer the leadership and support and recognise the strategic role of procurement within the organisation.

Much of the work of innovation procurement is undertaken in the identification and market engagement stages, before the formal tendering process gets underway. This pre-tender activity creates the necessary conditions for innovation in the customer organisation and supply chain. However, if an innovation procurement project is to succeed this pro-innovation approach needs to be continued into the tendering process.

Innovation procurement in action: the pilot projects

EcoQUIP was co-financed in the framework of EC CIP programme by DG GROW — Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs. It was carried out over four-and-a-half years from April 2012 to October 2016 and built on the experience of the pioneering Low Carbon Building-Healthcare (LCB-Healthcare) project.

The pilot projects all had in common the driving need for innovation and fell into two categories:

1. Existing service contracts coming to an end and the need for step-change improvements and service transformation
- The Rotherham National Health Service (NHS) Foundation Trust, Rotherham, UK: people-centred, low carbon catering services for hospitals
- The University Hospital of Bologna (AOSP), Emilia – Romagna Region, Italy: Integrated people-centered and environmentally sustainable facilities services

2. Problems that needed an innovative solution
- Erasmus MC, Rotterdam, the Netherlands: Sustainable bed-washing facility for a new hospital
- Nottingham University Hospitals NHS Trust, Nottingham UK: Ultra-Low Emission Energy Solution
- Sucha Beskidzka Hospital, Sucha Beskidzka, Poland: Providing thermal comfort for staff and patients while respecting environmental sustainability

Case studies

The Rotherham NHS Foundation Trust

People Centred Low Carbon Catering Services for Hospitals:

Transforming service provision, reducing environmental impact and increasing efficiency.

Situated in South Yorkshire in the north of England, the Rotherham NHS Foundation Trusts (TRFT) Hospital is an acute hospital with around 440 beds that provides services to around 66,000 in-patients and 295,000 out-patients per year.

> **❝AN IMPORTANT LESSON FROM THIS PROJECT IS THAT INNOVATION OCCURRED AS A DIRECT RESPONSE TO THE IDENTIFICATION AND THE FRAMING OF A PREVIOUSLY UNMET NEED❞**

Through the use of innovation procurement, a new catering contract is now delivering a higher quality catering service, with lower environmental impact and cost savings.

A long-term catering contract coming to an end coincided with the Trusts participation in the EcoQUIP project. The Trust proceeded to re-think its catering requirements in the context of delivering better patient services but also its commitment to procuring progressively lower carbon-catering services. The vision was to obtain "an innovative integrated solution for the provision of high quality patient-appropriate meals that are enjoyable, attractive, support patient recovery and are delivered as an integral part of nursing care", John Cartwright, Director of Estates and Facilities said on the project objectives. The FCP

Forward Commitment Procurement - FCP steps

■ **Suppliers respond to customer demand**

■ **Customers tend to buy what is available** - rather than asking for what they need..........this leads to 'more of the same' and stifles innovation

If there was a demand, we would invest to supply greener products

THE BUYER SUPPLIER PARADOX

If there was suitable and cost effective low-carbon alternatives available, we would buy them

There is a common 'catch-22' that hampers the commercialisation of low-carbon technologies

Courtesy of Health Care Without Harm
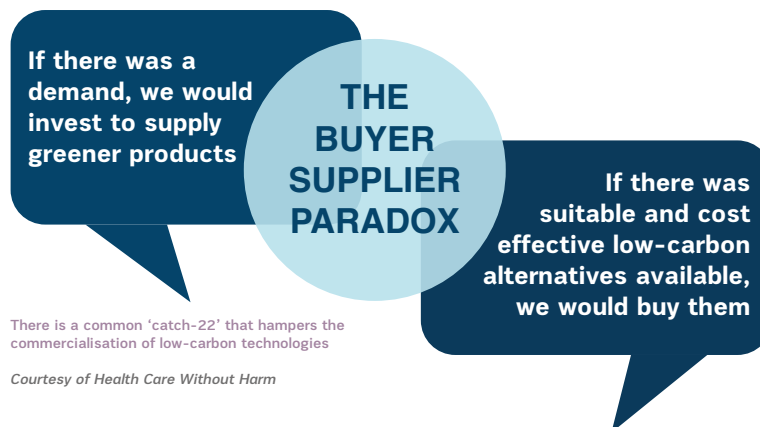
innovation procurement method was implemented with stakeholder consultation, early engagement with the market, use of outcome specifications, and pro-innovation tendering and contract terms.

Feedback from suppliers throughout the project made this approaches an extremely positive step forward in the way such services are procured. The incumbent suppliers immediately began to look at how they could improve the existing service, e.g. reduce plate waste, leading to approximately 2.5% reduction. They also tried alternative service models and ways to improve the patient experience. The Trust remarked "previously, we had only ever asked the catering provider for cost reduction. By putting out a positive requirement to the market it encouraged a creative response and showed that we needed to build a different kind of relationship with the supplier of the new contract. You need to ask for what you want and not assume that better means more expensive."

The Trust anticipates cost savings of over €1 mln over the first five years of the 5+5 year contract.

Erasmus Medical Centre, Rotterdam, The Netherlands

An advanced robotic bed-washing is a delivering auditable, replicable and green bed-washing.

Erasmus Medical Centre (Erasmus MC) is one of eight University Medical Centers in The Netherlands. Erasmus MC's vision is to become a recognised leader in health and healthcare innovation and has a strategic ambition to be a green, low-carbon hospital and to decrease the total amount of energy used in combination with efficient processes in the new hospital.

This pilot project was undertaken in the context of the design, build and equipping of a new 900-bed hospital being built on the same site as the 'old' hospital. The project related to the need to purchase a new bed washing facility/solution suitable for use

The innovative robotic bed washing facility purchased by the Erasmus Medical Centre Rotterdam (the Netherlands) was the **winner of the First Public Procurement of Innovation Award 2014**: *https://www.innovation-procurement/award/*

in the new hospital that could wash 70,000 beds every year. After a review of the existing bed washing facility, Erasmus MC decided to explore the ability of the market to supply a solution that met all their requirements. The bed washing solution should be environmentally sustainable, fit-for-purpose, and deliver replicable, consistent and auditable outcomes. The FCP innovation procurement method provided a tool to engage the supply chain in delivering a solution that would meet all these needs.

The project led to the creation of a totally new solution that delivers the required outcomes and has a lower total cost of ownership than the old

bed washing facility. Two advanced fully automatic robotic cleaning- units - known as "VMARCs" - are now installed and running.

Innovation often involves cross fertilisation between supply chains. This solution combines existing proven robotics technologies with new, and newly combined, innovations. Robotic technology, developed for car production lines has been adapted to solve the problem of bed cleaning in hospitals. The technology developed also has wider applications throughout the healthcare sector for resource-efficient precision cleaning of hospital equipment.

Erasmus MC has not only acquired a replicable, consistent and auditable bed cleaning process, but also a more cost-effective solution with a significantly lower environmental impact in comparison with the previous solutions and others, that were already available on the market.

The hospital commented that the product was completely new and developed directly in response to the innovation procurement project to meet the unmet needs of Erasmus MC.

The University Hospital of Bologna (AOSP), Emilia – Romagna Region, Italy
Integrated people-centred and environmentally sustainable facilities services: Transforming service delivery through innovation procurement.

AOSP - The university-hospital complex comprises 27 separate buildings or pavilions over 1.8km2 in the centre of Bologna. It has 1550 beds, 40 of day hospital and provides almost 4 million care, visits, tests to outpatients

This project concerns the radical transformation in the whole hospital complex of 'soft facility services', that is all the backroom functions that enable the hospital to maintain high standards of patient care and safety, including cleaning, supply logistics, patient movements, laundry and welcoming.

Historically these services have been provided by different suppliers with activities and tasks being carried out by a combination of external and internal staff. Through an consultative process the project team worked with stakeholders across the hospital to accurately understand the current situation, including the gaps and challenges being faced on a daily basis. Once this was clear, stakeholders were engaged in defining the unmet needs and developing an outcome-based requirement,that could be communicated to the market. The project was driven by three factors: the current contract was due to end, the hospitals participation in the EcoQUIP project and, later on in the project, the new procurement regulations which encouraged new approaches in support

of supply chain innovation, in particular early market engagement.

"It was clear to us that a re-thinking of the soft facility services provision was long overdue, both to address the inefficiencies and failings and bring forward innovation in service delivery and in the tools and techniques used," said hospital chiefs on the project.

Carbon reduction was included in the required outcomes of the tender, requiring progressive improvement over the life of the contract. The project helped to ensure that both management and staff understood and appreciated the relevant contribution that hospital services could give to sustainability, from the reduction of chemicals in cleaning, to correct use of water resources, waste management and recycling.

The market engagement process included the publication of a Prior Information Notice to launch a period of market sounding and a site visit for suppliers. The feedback from the supply chain to the hospitals outcome-based requirement convinced the management that the outcomes they needed were achievable. Given the scale and duration of the contract, the complexity of the organisational and IT integration and interface aspects, and the novelty of the approach for staff, a pre-tender trial of the new integrated service model was undertaken. These pre-tender actions helped to design a framework capable of addressing the potential risks of the new approach, for OSP and suppliers, while demonstrating the viability of the new service model. The new contract, with an approximate value of €22 mln

a year, is expected to be fully mobilised by mid 2018 and will include progressive improvements and innovation throughout the life of the contract.

Lessons learned

An important lesson from this project is that innovation occurred, not as a result of prior Research & Development (R&D), but as a direct response to the identification and the framing of a previously unmet need in the context of a procurement activity.

It is the prospect of a purchase order that effectively motivates suppliers to invest money, time and effort in R&D that is necessary to produce innovation. It should be stressed that in case of services, R&D presents different connotations. The basis is analysis, research and testing for which the participation of the day- to-day operating staff, as well as coordinators managers and direct suppliers of the service is essential. Frequently this activity is not sufficiently appreciated and can be qualified as a waste of time. It requires both within the hospital and with the supplier staff the willingness to produce innovation and the belief that it is possible.

It is the new, previously unmet demands, made by the customer that makes innovation natural and necessary. A perhaps surprising outcome of EcoQUIP was the enthusiasm of suppliers for this approach. ■

Gaynor Whyles is Director of JERA Consulting, a consultancy specialising in innovation. She is passionate about the role of innovation procurement in improving public services and stimulating economic opportunities and has been working in the field for over 10 years.

Dr Simona Agger Ganassi, Architect and Urban Planner, is the Chairman of the Board of EuHPN in which she represents the Italian society of Architecture and Engineering in Health (SIAIS). The EuHPN is an EU-based foundation promoting better standards and more effective investment in and management of health property throughout the EU.

KEY POINTS

✓ Innovation is supported by the EU for commercial advancement of the bloc but the concept of innovation procurement remains insufficiently understood and unexploited

✓ Healthcare is one of the largest contributors to public procurement in the EU, estimated at €2 trln per year

✓ The potential for finding an innovative solution is greatest when buyers specify desired outcomes and the pilots demonstrated this

✓ New customer demands make innovation natural and necessary

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Sustainability at heart of healthcare complex

Major hospital project aims to rejuvenate state's health service

A leading Australian health architecture firm has focused on patient experience to focus on sustainability and re-engineer the whole concept of how a hospital works.

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One of the world's most advanced hospitals - $1.71 bln new Royal Adelaide Hospital (RAH) in South Australia – reached technical completion in March and welcomed its first patients in September.

Designed by Silver Thomas Hanley in joint venture with Design Inc and constructed by Hansen Yuncken Leighton Contractors as part of a Public Private Partnership model, the 800-bed hospital can care for an estimated 85,000 inpatients and 400,000 outpatients each year. It is part of a multi-billion dollar Adelaide BioMed City health precinct.

The RAH, in the South Australian capital Adelaide, is set to be the epicentre of the state's health system and is reportedly the third most expensive building in the world. It replaces the old Royal Adelaide Hospital, which was established about 2 km up North Terrace from the new site in 1856.

Silver Thomas Hanley led the design for the new 180,000sq m hospital, 230,000sq m including car parking, following a brief based on a model of care aimed to rejuvenate and disrupt the way health services are delivered in South Australia.

"The Royal Adelaide is intended to be the jewel in the crown of that restructured statewide service," Silver Thomas Hanley Managing Director Ernest Girardi said. "They were very clear in the way they wanted the facility to operate, they were very clear about the model of care and the brief encapsulated a number of strategies, which enables them to deliver services differently, more effectively and in the long-run better for the consumer, the clinicians and the treasury. We re-engineered the whole concept of how a hospital works right down to the bedrooms."

The 10-level hospital on a sloping 10-hectare site has its main entrance on Level 3. The narrow piece of land was once home to the city's railyards. The design for the hospital was managed within the height restrictions posed by the flight path for the nearby Adelaide Airport.

The design

The clinical and public components of the building are orientated towards the North Terrace or city side of the building while the residential and inpatient components overlook the river and parklands from six triangular accommodation towers.

The landscaped gardens and courtyards are located within two minutes of all 800 patient rooms, which also feature views of the surrounding parklands and windows that open.

> 66 THE ROYAL ADELAIDE HOSPITAL IS SET TO BE THE EPICENTRE OF THE STATE'S HEALTH SYSTEM AND IS REPORTEDLY THE THIRD MOST EXPENSIVE BUILDING IN THE WORLD 99

Girardi said the design of the rooms were a good example of how the hospital's concept had been re-engineered to provide a patient-focused facility.

"If you walk into many current hospital bedrooms they are what I call the motel solution with the ensuite on the left or the right before you walk into the sleeping area – often you can't see the area where the patient is sleeping because the ensuite is in the way," he said. "What we did is we provided visibility both ways – from the corridor so the clinicians can look in without any obstruction and the patient can look out. It is a solution that is nothing like any other hospital bedroom in this country or the world for that matter."

The hospital's long and narrow shape has allowed it to be laid out vertically rather than laterally, in a

series of vertical clinical villages, which are accessed by three strategically located banks of lifts across the spine of the building.

"For instance, all the cancer services are not located on the one floor – you might not think that's a good idea – we've located them on top of each other at the eastern end of the building," Girardi said. "At the lower level we've got the radiotherapy bunkers where people have radiation treatment, on the next level we have the outpatient services for consultations or chemotherapy treatment and on the upper levels we have the overnight accommodation for the oncology patients. So clinical movement is generally up or down over two or three levels rather than lateral east to west along the hospital's long spine."

Similarly, at the western end of the hospital, the trauma modalities include the Emergency Department, Intensive Care Unit and operating theatres all stacked below the helipad and connected by a series of "hot lifts".

Technology

The Royal Adelaide's technology includes a fleet of 25 Automated Guided Vehicles (AGVs) to transport food, linen, waste and stores around the hospital, advanced telehealth facilities enabling staff to consult with colleagues and patients across the state, wireless

technology and equipment with tracking capabilities so it can be located quickly and easily and the biggest pneumatic tube system in an Australian hospital, designed to speed up diagnosis and treatment by rapidly delivering critical supplies like blood samples and medicine.

The long-term objective is for the facility to be paperless with all medical records, orders for pathology and medical imaging to be dealt with through devices and computers.

There is a tablet-style device in each patient room that can be used by consumers to do everything from surf the internet, watch TV and call nurses. The devices

can also be used by clinicians to order pathology and look up results.

"It's a very clever integrated engine that's been developed by our team, which is designed to provide technological access to all aspects of the facility; everything from booking rooms to ordering meals and calling a patient services ambassador can all be done from a single smart device," Girardi said.

Post-disaster function

As the centre of the South Australian health system, the hospital is equipped to respond to major disasters and will play a significant role in the state's post-disaster management strategies.

The Emergency Department at the new hospital has capacity to respond to chemical spills, with decontamination showers for mass decontamination, as well as natural or man-made disasters, such as a plane crash.

The new hospital also has capacity to respond to an infectious outbreak with five negative pressure rooms and a quarantine room that can be segregated from the rest of the department. The quarantine room is designed to the standards required to support patients with Ebola.

The hospital has also been built to withstand an

> **" PASSIVE SOLAR DESIGN ENSURES THAT THE USE OF NATURAL LIGHT IS INCREASED, MINIMISING THE NEED FOR ARTIFICIAL HEATING AND COOLING AND MAXIMISING ENERGY EFFICIENCY "**

earthquake, and has an independent water and electricity supply allowing it to operate in "island mode" for at least 48 hours in the event that these public utilities fail.

"Imagine an event like a smaller earthquake or a terrorist attack where services across the city were disrupted," Girardi said. "You need to think about what the Royal Adelaide is, it is the primary referral centre for South Australia so it's not surprising that it has that level of post-disaster function.

This is a world-class facility and I think we will start seeing a lot of people coming to Adelaide specifically to see what we've done there."

Green design

The hospital site features 3.8 hectares of green space including 70 internal courtyards, terrace and gardens, three wetland walks and an Australian Aboriginal garden.

Passive solar design ensures that the use of natural light is maximised throughout the hospital, particularly in high-traffic areas and patient rooms. This means taking advantage of sunlight to help to minimise the need for artificial heating and cooling and maximise energy efficiency.

The hospital also has a natural ventilation system, with suitably filtered fresh air to meet healthcare and infection control standards and minimise the impact of pollutants generated either internally or externally.

On site waste heat generation contributes towards the hospital's energy requirements, and an extensive energy metering and reporting strategy is in place to identify and manage energy consumption.

The new site also has mechanisms for capturing and storing stormwater run-off, and the facility uses captured and recycled water for toilet flushing and irrigation to minimise the use of mains water.

Girardi said the hospital's location on the edge of the city's parklands was also integrated in the design. The hospital was conceived as a hospital in a park.

"We took that theme further and integrated green spaces right through the facility," he said. "I think that one of the key features if you walk through the facility are the courtyards, they are really quite stunning and we were able to collaborate with a number of local artists to develop sculptures that have been installed into those courtyards and terraces. They are each really quite unique so they serve as a way finding element to help people find their way around the facility."

Girardi said there was a substantial evidence base that indicates that access to green spaces plays a major role in helping patients recuperate.

"The staff are equally important. When staff are on it can be a pretty harrowing and intense environment to work in so we've provided lots of opportunities for them including green space where they can get away from that stressful environment and take the opportunity to gather their thoughts and relax."

The hospital also has digital kiosks to help people navigate the building.

The precinct

The Adelaide BioMed City health precinct also includes the South Australian Health and Medical Research Institute, The University of Adelaide Medical and Nursing School and University of South Australia's Centre for Cancer Biology.

It is set to become one of the largest health and life sciences clusters in the southern hemisphere.

"We've completely changed the character to the point where the size of the workforce, the academics and the consumers that are going to be drawn to that end of town is going to attract a lot more in the way of restaurants and those sorts of amenities into the future," Girardi said. "We've integrated ourselves with The South Australian Health and Medical Research Institute building next door. We've got that public amphitheatre that we've incorporated into our design that deals with the level difference between the two entry levels. The amphitheatre is intended to be used as an open space day-to-day but that space will also be available for public performances and for the ongoing music and arts programme the hospital has embraced to the point where performances may be able to be broadcast to patients in their beds using the technology that has been incorporated into the facility." ∎

KEY POINTS

- ✓ The $1.71 bln new Royal Adelaide Hospital is part of a multi-billion dollar Adelaide BioMed City health precinct
- ✓ The 800-patient room facility has 10-levels and is situated in a 10-hectare site
- ✓ Extensive landscaped gardens are a feature of the hospital for staff and patient enjoyment
- ✓ Technology features include a fleet of Automated Guided Vehicles, advanced telehealth facilities, wireless technology and the biggest pneumatic tube system in an Australian hospital
- ✓ The hospital has five negative pressure rooms and a quarantine room and has been built to withstand an earthquake
- ✓ It has an independent water and electricity supply allowing it to operate in "island mode" for at least 48 hours if necessary
- ✓ Passive solar design ensures maximised use of natural light and a host of other 'green' features support energy and waste management sustainability

Andrew Spence is a South Australian journalist with extensive experience in a range of fields including health, architecture, wine, agriculture and technology. After more than a decade working with News Corporation, Spence has spent the past two years as senior writer with The Lead South Australia, which specialises in producing Australian news for a global audience.

Award-winning cogen facility provides independent green hospital power

How a Boston hospital is tackling energy use and lowering costs

An energy innovation is helping a key hospital in New England to save money and protect operations against outages.

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A cogen facility is enabling Boston Medical Centre (BMC), one of the greenest hospitals in all of the USA, to produce much of its own electricity and heat.

This innovation is translating into sizable savings in energy costs, augmenting hospital resources allocated for patient care.

The 2-megawatt combined heat and power plant (cogen) is about the size of a tractor-trailer and runs on natural gas. Unlike traditional power plants that release excess heat into the atmosphere, cogen technology works by trapping and reusing the heat.

Energy consumption reduction

BMC's cogen plant supplies more than 41% of the hospital's electricity and has the capacity to meet 25% of peak electricity demand at any given time.

"BMC can make a strong case for being the greenest and most resilient hospital in Boston," said hospital CEO and President Kate Walsh. "For us, increasing efficiency and resiliency makes financial and operational sense. Cogen will save about $1.5 million in energy and heating costs, which are resources we can spend on patient care, instead of utility bills."

The power plant further boosts the hospital's "black start" capability. This simply means that if the electric grid goes down, the hospital can restart the cogen plant and heat and power its inpatient units on an "island" for months at a time, as long as it has a supply of natural gas.

Security against disasters

The cogen facility is safely located on the roof of the Yawkey Ambulatory Care Center, high above any potential floodwaters.

"We've learned lessons from Hurricane Katrina and Sandy, which devastated the healthcare infrastructure in their communities," explained Bob Biggio, Senior Vice President for Facilities and Support Services. "Hospitals that had cogen were able to stay open and care for patients, while those without cogen were forced to evacuate. As the largest safety-net hospital and biggest trauma centre in New England, we have an obligation to protect our patients in a natural disaster."

Construction of the $15 million cogen facility was made possible by a $3.7 million grant from the Massachusetts Department of Energy Resources' Community Clean Energy Resiliency Initiative. The Boston Public Health Commission partnered with BMC in securing the grant.

> **❝ WE'VE LEARNED LESSONS FROM HURRICANE KATRINA AND SANDY, WHICH DEVASTATED THE HEALTHCARE INFRASTRUCTURE IN THEIR COMMUNITIES ❞**

Recognition

In addition to powering and heating much of the hospital, the cogen facility will also serve as a backup power source for city and state emergency communications.

"Projects like Boston Medical Centre's new combined heat and power plant are critical to ensuring that Massachusetts has a clean and reliable energy future," said Department of Energy Resources Commissioner Judith Judson. "We are proud to partner with BMC and the City of Boston to ensure that their facilities have the resiliency needed to provide the highest level of care to their patients regardless of extreme weather."

By reusing the trapped heat for hot water,

humidification and room temperature, BMC will lower costs by reducing its need for steam heat by an estimated 44, 000 pounds annually. Cogen will also reduce electric grid consumption by more than 16 million kilowatt hours a year.

The initiative has led to accolades. BMC is the recipient of three prestigious awards from Practice Greenhealth, the Top 25 Environmental Excellence Award, the highest honour Practice Greenhealth bestows on hospitals, as well as the Greening the OR Recognition Award and the Circle of Excellence award in the energy category. ■

Dran Coronado After earning his BA degree from the University of the Philippines, Dran Coronado worked as a business reporter with exposure to different industry sectors, including banking and finance, IT and e-commerce, PR/marketing, and business process outsourcing (BPO). Dran loves to travel and enjoys cooking and gardening.

KEY POINTS 🔑

- ✔ The cogen facility is enabling Boston Medical Centre to produce a large proportion of its own power

- ✔ The plant meets more than 41% of the hospital's electricity needs and will save about $1.5 million in energy and heating costs

- ✔ The power plant supports the hospital's "black start" capability enabling natural gas "island" powering of facility in event of loss of power

- ✔ The cogen facility is located above potential floodwaters and also serves as a backup power source for city and emergency communications

- ✔ Cogen will reduce electric grid consumption by more than 16 million kilowatt hours annually

- ✔ The move has seen BMC the recipient of three prestigious awards for green initiatives

Putting healthcare food waste in the spotlight

Food waste at hospitals can be recognised and addressed

An Irish healthcare sustainability programme aims to increase the catering efficiency of hospitals with steps to reduce waste.

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Non-profit organisation, Health Care Without Harm Europe (HCWH Europe), brings the voice of healthcare professionals to the European policy debate about key issues including sustainability. In order to support work on sustainable food in healthcare, they have organised international workshops and produced a report on sustainable food in European healthcare as a result of a survey with European hospitals. Eileen O'Leary from the Cork Institute of Technology has contributed to HCWH Europe's work in this area and spoke to HealthManagement.org about the challenges and best practices in sustainable food in healthcare.

How does healthcare define food waste?

Under the Irish Green Healthcare programme, which we run on behalf of and is co-funded by the National Health Sustainability Office (NHSO) within the Health Service Executive (HSE) and by the Environmental Protection Agency (EPA), we have performed a large number of food waste surveys in both acute and non-acute healthcare facilities.

The HSE is Ireland's national public health service. Green Healthcare's focus is on efficiencies and savings in relation to water and waste in Irish healthcare facilities.

To perform these food waste surveys we have taken the definition of 'waste' in general under EU law, i.e. something is a waste if it is discarded/to be discarded, and applied this to food arising in a catering scenario. Thus, when we are performing food waste surveys, any food that is 'discarded or to be discarded' we have taken as food waste. Thus, it will encompass all biowaste/food arising from food preparation, cooking, serving, clearing plates after patients/staff have finished eating, wash-up after service, as well as anything discarded from storage.

In order to help identify options for improvement, we further break down food waste into different categories as follows:

- Unserved food waste. This is edible food that is left over in bulk service containers, bain maries, kitchen pots, etc. after service, that is subsequently discarded (any food that is retained and stored for future use is not counted). For centrally-plated systems, it may also include untouched plates of food that were never served. It may also include items that are out of date discarded directly from storage (we have found the latter to be relatively very small as a source of food waste; there are usually good stock rotation systems in place).
- Plate waste. This is edible food remaining on plates, bowls, etc. after patients/staff have finished eating.
- Preparation waste. This is food waste that arises in preparing and cooking of food. This may or may not be edible. It is often unavoidable. It includes things like vegetable peelings, salad off-cuts, meat/fish skin/bones, bread heels, tea-bags, coffee grounds, and so on.

Putting a focus on the first two of the above areas (unserved food and plate waste) in terms of the quantities arising, food types, and sources within the facility can help identify actions to reduce food waste amounts.

What needs to change in terms of seeing food as integral to a patient's treatment?

It needs to be led from top management within a healthcare organisation. Systems like protected meal times, if in place, need to be respected by medical staff and properly enforced.

International best practice examples, showcasing healthcare organisations that place food and nutrition central to patient care, could help.

In the longer term, it needs to be ensured that it is addressed within the education system for all medical personnel.

In terms of financial wastage, what sort of figures are we talking about when it comes to hospital food waste?

It is often the cost of a brown bin waste service that people tend to focus on. However, the associated cost

Food trays ready for loading

Held dinner due to patient absence which ended up as food waste

Unserved desserts become food waste

Unserved food in hospital canteen after service

❝ SEEING FOOD AS INTEGRAL TO A PATIENT'S TREATMENT NEEDS TO BE LED FROM TOP MANAGEMENT WITHIN A HEALTHCARE ORGANISATION ❞

of food waste in terms of lost food purchases always dwarfes the size of the bin service costs.

The Green Healthcare programme performed a detailed food and food waste cost assessment at an acute hospital in Dublin. This covered the three weeks of the hospital's menu cycle. It quantified the total amount of food purchased for the three weeks, and performed a stock take at the beginning and end of the three weeks. This provided the total amount of food used in terms of Euros and kgs.

This survey showed an average cost of food per kg of €2.29/kg. Based on an associated food waste survey, it was found the average cost of edible food waste (unserved food and plate waste) per kg was €2.05/kg. The difference is down to cheaper food-stuffs taking up a larger percentage of the waste, i.e. meat and fish are more likely to be better portioned. Similarly, surveys in the hospitals have shown that, on average, 70% of food in food waste bins is edible food which was meant to be eaten (unserved food and plate waste). The remainder 30% was food with no value (preparation waste).

Thus, each full 240-litre brown bin represents about €170 in lost food purchases, while it usually is only about €10 per bin in waste handling charges. An

alternative way to look at these numbers is that 1000 kg or 1 tonne of food waste arising in the brown bins for a hospital represents over €1,400 in lost purchases. This allows a hospital with the total annual tonnes of food waste available to it from its waste contractor to put a cost of food purchases lost as food waste each year.

There are several hospitals in Europe that are implementing best practices and innovations in food management and succeeding in reducing food waste. In your view/s which are some of the most successful and why?

The Green Healthcare programme has a number of case studies on Irish hospitals that have taken steps to reduce their food waste. One of the best performers surveyed was Mayo General Hospital. Another hospital that has made improvements is St Michael's Hospital, Dún Laoghaire. I think success is in many cases down to the staff involved.

From your experience of focusing on best practice in food management, is it possible for a hospital to start taking simple steps to see immediate reductions in food wastage?

Most definitely. The best first step to take is to start observing food waste amounts arising at the different points around the hospital (wards, main kitchen) and at different meals. Often due to the layout of the hospital, the food waste generated at the wards is never seen by the main kitchen. Even if a hospital starts only observing and not weighing food waste, it may help inform what could be done. Often, the limiting factor in implementing changes can be staff time. A catering department can use the waste data and its associated purchasing costs to make the financial case to management to seek the provision of some additional staff time to help implement changes, where needed (e.g. through better coordination of ordering from the wards).

Irish healthcare facilities, and commercial facilities in general in Ireland, are fortunate in one respect in that it has been mandatory by law since 2009 to segregate food waste for collection, in order for it to be sent for composting or anaerobic digestion. Thus, the amounts of food being wasted are much more visible, compared to food waste being handled via a mixed waste collection or a macerator to sewer. In addition, data on total tonnages of food waste can be obtained since such waste is weighed by the waste contractors.

I'd like to add that, as well as tracking total food waste amounts, it can be useful for a hospital to benchmark itself against its peers, as well as against itself year on year. The Green Healthcare programme has produced an average benchmark for all wastes for acute and smaller community hospitals, and for food waste too, which is based on a kg per patient bed day basis. For acute hospitals we have found an average of 0.73 kg of food waste per bed day, while best practice was 0.45 kg of food waste per bed day.

As part of the food waste surveys carried out, the Green Healthcare programme has also measured the total weight of food prepared. Thus, it has been able to determine that on average 51% of the food prepared is eaten by patients, with 27% being unserved food waste and 22% ending up as plate waste. ∎

KEY POINTS

- ✓ 1 tonne of food waste arising in the brown bins for a hospital represents over €1,400 in lost purchases
- ✓ Under EU law, something is a waste if it is discarded/to be discarded
- ✓ To identify options for improvement, food waste is broken down into Unserved Food Waste, Plate Waste and Preparation Waste
- ✓ Regarding food as part of patient treatment needs to be led from top management
- ✓ Protected meal times need to be respected by medical staff and properly enforced
- ✓ Lost food purchases always dwarves the size of the brown bin waste service costs
- ✓ To improve, start observing food waste amounts arising at the different points around the hospital and benchmark against its peers and itself

Reducing Waste
As recommended by Eileen O' Leary, a Best Practice Guide on food waste reduction in healthcare as well as guidance on how to undertake a food waste survey in a healthcare facility is available at: **greenhealthcare.ie/wp-content/uploads/2014/05/Best-Practice-Food-Waste-revised.pdf**

Eileen O'Leary is part of the team in the Clean Technology Centre (CTC), a not-for-profit environmental consultancy and research group at Cork Institute of Technology in Ireland. This group explores ways to increase the resource efficiency of Irish businesses and organisations in terms of efficient energy and water use, and reduced waste.

Embedding sustainability into clinical medicine and medical education

Why it should and how it can be done

How one healthcare body is introducing education on sustainable healthcare across the sector.

Environmental change is an increasingly important determinant of health and of the ability of societies and healthcare services to respond to ill health. Climate change has been recognised as the "biggest global health threat of the 21st Century" (Costello et al. 2009). Its effects on health are predicted to be overwhelmingly negative, impacting on the social and environmental determinants of health (World Health Organization, 2017). Healthcare professionals have a duty to protect health and can do this by focusing on the four principles of sustainable clinical care: prevention, patient empowerment and self care, lean systems and low carbon alternatives.

Furthermore, there is an imperative and a legal duty to reduce waste and resource use, in particular carbon emissions. The NHS is committed to reducing its greenhouse gas emissions by 80% on 1990 levels by 2050 (UK Parliament, 2008). In addition to this, environmental, social and financial resource constraints risk impacting on the quality of healthcare services. Recognising this, the Royal College of Physicians has identified sustainability as a domain of quality (Royal College of Physicians, 2011). Doctors need to be equipped to lead the delivery of a sustainable health service.

It is imperative that future doctors are capable of meeting these challenges and medical education is central to a sustainable future for healthcare. Current areas of focus such as public health and health inequalities, quality improvement, medical leadership and ethics can usefully be approached through the lens of sustainability.

Embedding sustainability into clinical care.

Embedding environmental sustainability into the health sector has been the goal of the Centre of Sustainable Healthcare (CSH) since 2008, when it was established. NHS estates were originally the main focus of efforts to improve sustainability however this approach was reassessed when research on the carbon footprint of the NHS found that clinical services were responsible for the majority of greenhouse gas emissions (Sustainable Development Unit, 2008).

As a means to address this CSH developed a particular focus on engaging clinicians and promoting the concept of sustainable clinical practice. It has done this by setting up a sustainable specialties programme, developing a Sustainable Quality Improvement methodology and working with hospital Trusts on sustainability projects.

> **❝ THROUGH CENTRE OF SUSTAINABLE HEALTHCARE MECHANISMS IT HAS BEEN POSSIBLE TO RAISE THE PROFILE OF SUSTAINABILITY WITHIN CLINICAL MEDICINE AND TO MAKE SUSTAINABLE CHANGE ❞**

The Sustainable Specialties programme fosters change within clinical communities. It does this by supporting clinicians to learn about sustainability, promote and teach about it, evaluate their specialty and determine where sustainable changes can be made (in postgraduate colleges, at a commissioning and policy level or on the ground with colleagues and patients) and get involved in innovating themselves. This approach was originally and successfully demonstrated in kidney care in 2009-11 when CSH established a Green Nephrology Fellowship. The fellows developed a Network of local sustainability

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representatives in more than 80% of UK kidney units. They also worked on a programme of research, annual awards and practical initiatives developed within renal medicine. Following this, in 2013, The Royal College of Psychiatrists became the first medical Royal College to fund a Sustainable Specialty Research Fellowship. The fellow was responsible for organising a Sustainability in Psychiatry Summit and the launch of an RCPsych Sustainability Award. Focussing on policy and commissioning he produced a report for the Academy of Medical Royal Colleges (Maughan and Ansell, 2014) and a guide to sustainable commissioning (Joint Commissioning Panel for Mental Health & Centre for Sustainable Healthcare, 2015).

As this approach has evidenced, enabling clinicians to make change from within their own specialties has the potential to have a significant impact on clinical care. CSH has therefore developed scholarship programmes within other specialties. CSH training on sustainability, mentoring, resources (including carbon footprinting), advisory groups and networks have all helped support the fellows and scholars in their efforts and have been a fundamental part of embedding sustainability into clinical practice. Specialty networks have been an invaluable tool in promoting sustainability and transformative models of care but also to provide support to those endeavouring to make sustainable change. They help avoid duplication of work and bring a wealth of knowledge and advice to all those engaged in sustainability **networks.sustainablehealthcare.org.uk**.

Other tools also help provide clinicians with a framework to make sustainable change. One of these tools is a Sustainable Quality Improvement (SusQI) methodology. Increasingly clinicians are being expected to get involved with quality improvement projects. Understanding how to study, plan and execute changes to healthcare pathways that involve not only improvements in health outcomes and reductions in financial costs (as in traditional quality improvement) but also reduce environmental and social costs as well can be difficult. The SusQI method provides a clear way to do this and has been used effectively by clinicians to develop and subsequently evaluate work to improve the quality of healthcare.

Along with its project and research work with CCG's, industry and other bodies (e.g. carbon foot printing a service, comparing the sustainability of different care pathways, supporting the expansion of inhaler recycling) CSH also works with hospital Trusts to run the Green Ward Competition. This is a clinical engagement programme where clinical teams are recruited to compete against one another and are supported by CSH to develop sustainability projects and measure environmental, financial and patient/staff benefits. This alternative method of working with clinicians in a clinical setting has proved popular and successful leading to cost and carbon savings as well as patient benefits (Centre for Sustainable Healthcare, 2017).

Embedding sustainability in clinical care is not just about making change inside the clinic setting but also outside. Acknowledging that green spaces are part of the tapestry of promoting and sustaining health, CSH's NHS Forest project has worked with healthcare organisations to value their green spaces and promote better use of the natural environment by staff, patients and local communities.

Through these mechanisms above it has been possible to raise the profile of sustainability within clinical medicine and to make sustainable change. Using this approach has ensured that changes have been driven by those who know the system best and have not been imposed from above.

Embedding sustainability into medical education

Sustainability is gradually being embedded into medical education. CSH has facilitated this by hosting the Sustainable Healthcare Education (SHE) Network. This is a network of students and educators interested in preparing health professionals to build and work in a sustainable health service. The network has been instrumental in driving sustainable change within medical education. In September 2011 the General Medical Council asked the SHE Network to make recommendations for priority learning outcomes for sustainability, to inform the on-going development of undergraduate and postgraduate medical curricula. The resulting priority learning outcomes have been

Sustainable Specialties
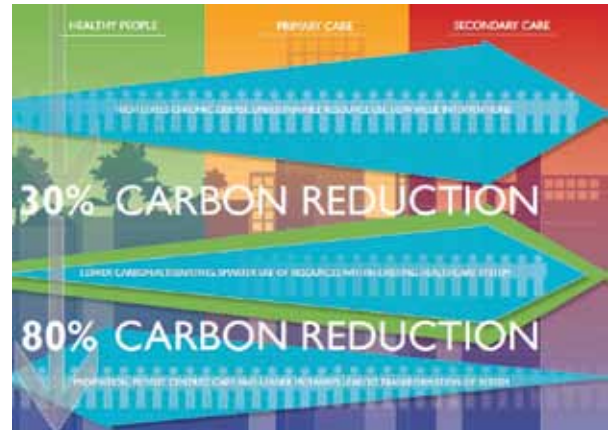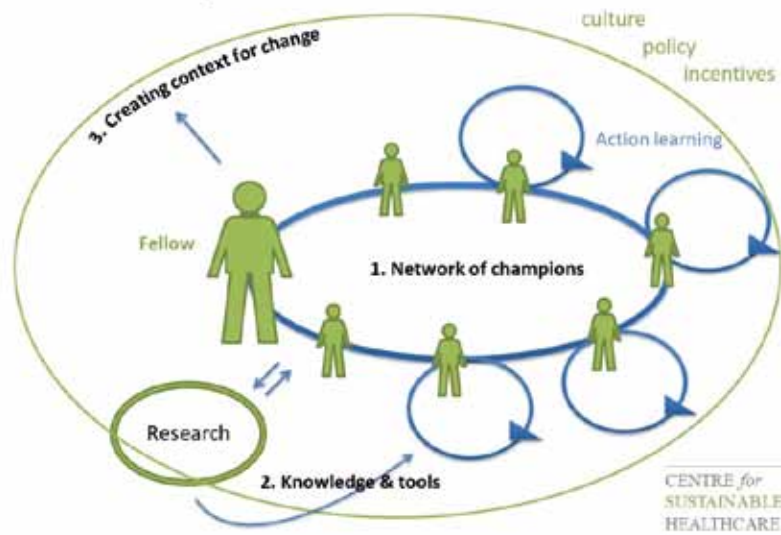
referenced in the GMC's outcomes for graduates' (General Medical Council, 2015).

Since then the SHE network has continued to work in medical education nationally and internationally researching, teaching and promoting sustainability. Members of the SHE Network have worked with UK medical schools to develop courses on sustainability (Walpole and Mortimer, 2017) and a bank of case studies and teaching materials is being collated. The SHE Network aims not only to support effective teaching, learning and assessment for sustainable healthcare literacy but also to effect change in curricula and work further with regulatory bodies to bring sustainable healthcare into mainstream teaching.

Embedding sustainability into clinical care and medical education requires a multifaceted approach that utilises the ability, knowledge and networks of those working in healthcare and healthcare education, supported by a framework of resources, methodology and research. Regulatory bodies, guideline, research, standards and reference organisations as well as providers, commissioners, industry and other health groups have all been engaged in the approach

that CSH has taken, focussing on the power of individuals and networks to drive improvement and a more sustainable way of working. ■

KEY POINTS

✓ There are important legal, ethical and public health reasons to embed sustainability into clinical care and medical education

✓ Clinicians can effectively drive sustainable change from within their specialty

✓ Networks are essential to support and promote sustainability

✓ Sustainable healthcare education is fundamental to a sustainable future

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Future-proofing health to meet sustainable development goals

Can the integration of sex and gender policies reset the agenda?

An evidence-based shift is needed in the approach to women's healthcare and greater fulfilment of the United Nations Sustainable Development Goals.

What is the state of women's health?

Women's health remains an unfinished agenda. Health interventions and infrastructures are dominated by short-term rather than long-term objectives. Women's health is not viewed as an urgent topic and consequently competes with other pressing issues which often win out at the expense of women and their families (Kahneman 2011).

This year, 2017, marks the European Institute of Women's Health's (EIWH) twenty-first anniversary and sixty-years of gender equality in EU policy since pay equity was first enshrined in the Treaty of Rome (1957). We must take the time now to look at the progress that has been achieved and devise steps for moving forward together to better tackle sex and gender inequities in health.

How far have we come in understanding and reducing inequities in women's health over recent decades?

Large differences between women and men exist across various health conditions. Some are primarily determined by biological variation. Others are the result of the manner in which societies socialise women and men and the power relations between them. Many health disparities reflect a combination of both the biological differences and social factors. Understanding this interaction is important for addressing sex and gender inequities in prevention, diagnosis, treatment and care, ultimately, for improving health in both women and men.

So we know based on the evidence that sex and gender are key determinants of the health of women and their families from both the social and biological perspectives, although the reasons for these differences are not fully explored. However, the issue of gender has been over intellectualised. As a result, many of the identified gaps and issues have not been systematically tackled. Policy, research and care have failed to adequately integrate sex and gender differences in health at a high cost to women and their families. Today, society must shift to a citizen and patient-focused view of health. We must continuously change and be flexible to work to reduce all health inequities.

> ❝ FUTURE-PROOFING HEALTH TO MEET WOMEN'S AND FAMILY'S NEEDS IS THE COMPELLING REASON TO CHANGE ❞

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I spoke on the question of women's health at the Politico Health Summit in Geneva in October. As a European Institute of Women's Health (EIWH) Board member, I was curious to see during the Health Summit how, when and if women's health and gender equity appeared in the discussion. I noted how the panel structure and programme for the day unconsciously mirrored the current state of our society reflecting areas where women generally have and have not a voice.

The Sustainable Development Goals (SDGs) were described by European Union Health & Food Safety Commissioner Vytenis Andriukaitis as the blueprint for our world's future, underpinned by health. Throughout

the day, keynote speakers and panel members, acknowledged the silos, barriers for change - both resource and finance-based - and demonstrated the tension between the differing agendas of civil society and commerce. The need to do 'something' was stated. However, the commitment to own, take responsibility and act was missing. It was repeatedly positioned as someone else's responsibility to make it happen and held back by 'insufficient resources'.

Progress will require a multi-sectoral, all-policy approach including, health, social and business. What is the common focal point which makes it essential to communicate, align and get better results? Commissioner Andriukaitis stated health as the common theme. EIWH builds on this argument stating that consideration of sex & gender in all aspects of policy is the logical place to begin in policy development. Customised interventions could then be designed and deliver better outcomes for women and men.

Since the foundation of EIWH 21 years ago, the body of evidence-based recommendations gathered with the support of our Network of Experts can be summarised into one action; reset the agenda. By this I mean, incorporate sex and gender into all policies and programmes. The challenge for organisations like EIWH, is how to articulate the societal opportunity considering gender equity creates so that our call to action is taken seriously and recommendations implemented by all stakeholders.

Society has the opportunity to improve healthcare, so it is fit for purpose and adequately meets the needs of all people, including women as citizens, patients, family members, friends, healthcare professionals and caregivers. The EIWH's position is clear; we need to use the existing evidence base to reduce gender inequities in health and personalise medicine for the unique needs of women and men. How to improve the current state of women's health? We must focus on and improve the existing evidence base and effectively and systematically incorporate sex and gender from the beginning into policy rather than as an afterthought or tick-box exercise.

For example, women make up the largest proportion of the older population and are the heaviest users of medicines. In order to reduce these and other medicines inequities, the EIWH worked with other organisations to ensure that both gender and age were systematically included in the new Clinical Trials Regulation 536/2014 implemented in 2016. The EIWH believes that sex and gender should be incorporated throughout medicines research and regulation to ensure the best health outcomes for women.

Therefore, sex and gender must be systematically incorporated into clinical trials, access to healthcare, education, social policy, employment and other areas relevant to health. However, the challenge for all stakeholders is translating the evidence from theory into practice in the pre-existing health structures. We must integrate sex and gender to deliver healthcare that allows all citizens to thrive. This shift involves institutional change, innovative thinking and constantly improving work practices.

As a woman and a consumer, I expect my health management needs to change and my needs to be met as I age and care to be improved when evidence-based recommendations are made. It's up to us collectively and as individuals to increase momentum, take action and leverage the opportunity gender equity creates to optimise the health of women and men.

This evidence-based shift requires institutional change, disruptive thinking and constantly improving ways of working. Future-proofing health to meet women's and families' needs is the compelling reason to change. ∎

KEY POINTS

- ✓ Women's health is an unfinished agenda
- ✓ Healthcare must examine progress and take steps to balance gender inequities in the sector
- ✓ Progress needs a multi-sectoral, all-policy approach including from health, social and business stakeholders
- ✓ Customised interventions could lead to better healthcare in line with the United Nations Sustainable Development Goals
- ✓ The EIWH believes gender should be taken into consideration in medical research and regulation for best health outcomes for women and men
- ✓ Future-proofing health to meet women's needs is a compelling reason to change

Sinead Hewson is an entrepreneur with a health and communication background who sits on the Board of the European Institute of Women's Health (EIWH). She has been a gender advocate for more than twenty years and acts as the consumer voice for the EIWH.

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Turning burnout into bright futures

Why burnout needs to be addressed now and not later

Burnout in cardiologists has serious implications on the lives of patients. Healthcare experts all over the world draw their conclusions on an issue which is highly prevalent amongst cardiologists and how to maintain sustainability within healthcare.

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How energised are you by your work? Are you constantly dissatisfied by your career? Are you victimised or do you feel personally unable to get through the day due to a toxic or negative environment?

If any of those answers are yes, then you may be going through what is known as "burnout". A term typically used for something which is rising across healthcare workers, in particular cardiologists.

Burnout in healthcare has serious negative personal and professional consequences and is associated with suboptimal healthcare outcomes for patients. More and more healthcare workers are feeling the strain and the time has come for leaders to recommend the best strategies for promoting wellness.

Burnout is primarily driven by professional and healthcare system demands and inefficiencies such as excessive workload and role complexity, training and certification demands, inefficient compensation models and lack of resources, computerisation, and loss of autonomy.

Moreover, loss of connectedness with patients, difficulties in balancing work and personal life and over-valuing compulsiveness and perfectionism in medical practice further increase the risk of burnout (Panagioti et al. 2017).

Cardiologists suffering from burnout may be best mitigated by organisational strategies complemented by individual stress reduction and reflection techniques under the resilience-based approach. Large-scale strategies are needed in creating a new culture in medicine (Panagioti et al. 2017).

A recent report by the Point of Care Foundation 'Behind Closed Doors' (Behind Closed Doors 2017) brought to light the issues that staff face because of burnout, an issue which in fact starts from the apex of the entire healthcare system. The report highlighted how NHS staff have become the "shock absorbers" of an NHS under chronic strain. It raised several issues that take place including discrimination, harassment, and lack of motivation in the workplace, as well as the lack of self-confidence in ability to succeed in their career, either due to no support of career progression or the toxic environment which some staff are surrounded by.

In order for these issues to improve, those at the top end of the power ladder need to show encouragement, support and an example to lead by from the outset. Furthermore, there needs to be more motivation for staff who continuously work hard but yet receive nothing back, as well as better working conditions and acknowledgement of a more balanced working/personal life.

Such issues could also be improved by the aid of personal courses and programmes. FutureLearn is a platform that delivers courses at massive scale with discussion between learners at the heart of the experience. They list a number of motivational courses and programmes from top universities and specialist organisations to help people from all walks of life, and these programmes are initiated from all over the world. Programmes and online courses vary from literature, to career, to study skills, to health and psychology.

One such health and psychology programme offers people the opportunity to learn more about how to apply mindfulness techniques, which anyone can enroll in - Monash University's course on the FutureLearn social learning platform: Maintaining a Mindful Life.

Assoc. Prof. Craig Hassed, co-ordinator of mindfulness programmes at Monash University spoke to HealthManagement.org about his views on burnout.

"Burnout is a term used to describe a state that covers three main symptoms: emotional exhaustion, depersonalisation (e.g. cynicism, lack of caring) and lacking of a sense of personal accomplishment. It is commonly the result of long-term and unresolved work-related stress. Burnout is not the same as depression, although people with burnout are more at risk of depression."

"Burnout is seen in many professional groups but health professionals are a very high risk group because they not only have high pressure jobs with high expectations placed upon them, but also because the emotional demands of working with patients and their families can be significant."

Indeed, people are more at risk during times of transition in working life, such as graduation or promotion and naturally the effects of burnout are particularly sensitive during this period, because this is a time when support and training is especially needed, and anything less will affect the quality of communication, care, efficiency, work engagement and quality of work. And as soon as the person starts feeling like they are essentially failing and a disappointment, their state of mind will deteriorate.

One Australian study measured burnout and mental illness every three months amongst new medical graduates (interns) and found that by eight months into their first year of working life, 75% qualified as having burnout (using Maslach's Burnout Inventory) and 73% had a diagnosable mental illness on at least one occasion.

Prof. Hassed explains, "This points to a major deficiency in how we train health professionals to do demanding jobs in that we focus on the technical skills and knowledge during training, but ignore the personal and professional development needed to meet the demands that go with the job. That is a reason why, at Monash University, all of our health professional students are introduced to skills like mindfulness which have been found to significantly reduce burnout symptoms and foster good mental health."

Prof. Barbara Casadei, an established professor at the University of Oxford, and President-Elect of the European Society of Cardiology, led a very insightful session at the European Society of Cardiology (ESC) Congress in Barcelona in August where the session discussed the topic of burnout amongst healthcare workers and whether the issue differed between males and females.

Prof. Casadei discussed the recent Medscape survey which took place in the US this year and analysed the population of medical workers suffering from burnout. The survey was discussed with the board of the ESC so that they could address some of the major themes that were problematic.

This problem has been a huge issue in the US where many professionals lack enthusiasm for work, suffer from cynicism as well as low self-accomplishment. The survey showed that 46% of cardiologists complained of having felt like this at work.

Consequences of burnout
There are a number of consequences that can arise from burnout and they range from minor to severe. All

of the expected issues including divorce, alcoholism, substance abuse, depression, and worst yet, suicide, may take place.

Prof. Casadei explains, "With regard to professional cases, if an employee feels underappreciated, unmotivated and more, essentially they will give off lower quality of care, and there is indeed a higher chance of medical error, and greater malpractice risk. A situation such as this needs to be avoided, not just for the person in question, but also for the patient."

As many as 400 doctors, the equivalent of two to three graduating medical-school classes, die by suicide every year, according to the American Foundation for Suicide Prevention – the profession has one of the highest rates of suicide (Physician and Medical Student Depression and Suicide Prevention 2017).

Is there a gender difference in burnout?

When considering the issue of burnout, one must question whether there is a difference between the male and female population, considering the underlying issues of sexism and discrimination that currently exists professionally.

In this year's Medscape Lifestyle Report, as in previous years, a higher percentage of female cardiologists (55%) reported burnout than their male peers (51%). Percentages have trended sharply up for male cardiologists but slightly down for females since this question was first asked in Medscape's 2013 survey. That year, 59% of women and 38% of men reported burnout.

The lifestyle survey, such as in previous years, asked physicians to rate their happiness at work and outside of work on a scale of one to seven, with one equalling "extremely unhappy" and seven equalling "extremely happy." Among cardiologists, 66% of women compared with 54% of men said they are very to extremely happy outside of work, while more men (32%) than women (25%) reported high happiness levels at work. Overall despite the differences between genders, indeed both male and female cardiologists share the same notion of being far happier outside of work.

According to Prof. Casaedi, the ESC is trying to address what kind of institutional support professionals get vs what they need, what kind of commitment from seniors, how supported are workers, and in which regards do they actually receive help?

Prof. Casaedi highlighted how crucial it is that cardiologists have a decent level of relationship and trust, with the ability to express views clearly in a working environment. In addition, how much do staff's personal values align with their institution? All of these issues ultimately affect a person's state-of-mind, and essentially can increase the risk of burnout.

"If you're not aligned with your institution then you're

automatically going to feel distressed," explained Prof. Casadei.

Calling for culture change

A recent C-Change (for culture change) survey of ESC members across 17 countries found that at least a third of respondents reported burnout. The findings also reveal important differences based on gender and geography.

Of the nearly 4,000 cardiovascular professionals who responded, the poll found that in Eastern Europe, 35% of men feel mentally or physically exhausted while the figure of women was higher, with 45%. In Southern Europe, the ratio is 31% male versus 41% female, while in Northern Europe the gender gap on the issue virtually disappears: 32% male; 34% female.

"The results in Northern Europe are heart-warming, energising, and optimistic that despite the difficulties, the leadership aspirations are very high, people are resilient they still want to succeed and do a good job while the results from Southern and Eastern EU demonstrated that there is not much encouragement and support for them to pursue a successful career within cardiology.

"This survey is a valuable first step to identify problems in the workplace. It will no doubt help the ESC provide appropriate support to cardiologists and cardiovascular scientists and enable the Society to be a more effective advocate for its members," Prof. Casaedi added.

The C-Change questionnaire is designed to probe the culture of medicine, particularly academic medicine, and was developed by Brandeis University in the USA. The ESC partnered with Brandeis to administer the poll in Europe. Of the respondents, 59% were men, 41% were women, and the majority (69%) were clinicians.

The results, released at the ESC Congress, reveal that women are just as ambitious as men and that both:

- Seek better training opportunities, better standards and more focus on quality of care delivered (versus quantity);
- Find it difficult to succeed without sacrificing personal and/or family commitments;
- Want improved leadership and vision, as well as more opportunities for research and international connections.

While 80% of the men and women polled want to be influential in making change happen within their department or institution, only about half say they feel encouraged to pursue leadership positions in cardiology or become involved in decision making. Perhaps even more troubling, 20% of men and 28% of women say they have often felt intimidated, coerced or belittled by superiors or colleagues.

"The ESC already supports training in leadership," says Prof. Casadei, "and there are plans to introduce new training opportunities in negotiation skills and people management to help ESC members better address some of these needs."

One cardiologist who took part in the survey said "The burnout atmosphere at work is what prevents me from being more successful. Lots of colleagues are depressed, over-worked, there's not enough positions for the amount of work, and, there's no time for education and mentoring".

While another said, "I really love my job, it's as fun as a game of tennis but sometimes the court is without lines or a net, and the referee is blind. So it's just politics."

Taking into consideration all of the answers, the overall highlights include:

- overworked
- too much routine
- discrimination
- bullying
- no institutional strategy or vision
- conservatism
- bureaucracy
- hierarchy
- focus on quantity over quality in healthcare
- isolation

It seems that throughout Europe, bad management and poor leadership are the major issues that have been highlighted.

"The criticism and the way people feel is widespread and common, which is a clear sign that the situation definitely needs to be improved. However, there is a difference in interaction between gender and region. In the Southern and Eastern regions, females have a high level of burnout which is higher and more comparable to what has been recorded in the US.

"This is not because of the typical reason one might argue, i.e. women have children and are stressed," explains Prof. Casadei, "but in fact, the greater level of burnout is mid-career. And these results echo those that have been recorded in the US."

Prof. Valentin Sinitsyn, Head of the Radiology Department in the Federal Center of Medicine and Rehabilitation and Head of Radiology, Moscow State University, and board member of HealthManagement's Imaging department is also in agreement on the issue:

"The professional burnout has turned into one of the most serious problems in radiology. I never thought about it as a young radiologist, but now, in spite of my status and achievements, I feel that "burnout syndrome" has become my problem too.

"My major problem is a clash between multiple academic and professional responsibilities. I wish I could

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spend more hours in my department, yet at the same time I like to be involved in teaching, training and be part of new research projects. Too many responsibilities, computerisation, meetings and deadlines create stress and the feeling that I have been permanently failing to accomplish my multiple tasks and duties. Now I feel that my work-life balance must be returned and one should think about the definition of new professional and private priorities. I do not want to leave my profession because of this problem and would like to be more productive and more efficient – but without the feeling of burnout and exhaustion. I just hope I will be able to make it."

Going forward

In order for the situation to improve, prevent burnout, and therefore maintain sustainability, there are a number of factors that come into play. These include balancing work demands with resources, maintaining a healthy lifestyle, fostering a supportive culture at work, finding meaning within the work, and cultivating practices like mindfulness. As Prof. Hassed explains, "Sometimes a person needs to take a break from work to give them a chance to recharge and establish self-care practices, and even to consider whether they are really in the right career for their personal goals and needs. Either way, we may need to change the work we do, or change the way we do it."

Echoing the need for support in healthcare, Oral A. Waldo, MD, and Martin E. Goldman, address the issue of burnout in an article published in the Journal of the American College of Cardiology (JACC). They recommend the "three R's" – relaxation, reflection and regrouping – as a strategy to avoiding burnout during fellowship.

"Cardiology FITs (fellow in training) are so keen to increase their productivity and attain new heights in the profession that they frequently forget to take time to replenish themselves," states Prof. Waldo. "There is no doubt – it is best to avoid burnout rather than [to deal] with it."

"Ensuring a balance between clinical service duties and education, organising frequent social events for the fellows and by providing support on a personal level when needed. Outside of the work environment, dedicating quality time for family and friends has also been key in preventing burnout," Prof. Waldo explains.

According to Prof. Casaedi, the weight of patients and citizens should have an impact on the decision-making that is really relative to health. There is a great need to support the need for work-life balance, stability and part-timers. Flexibility is more important than the number of hours, staff just require flexibility – a fact prevalent in both the US and Europe.

Indeed, the only way for professionals to be happy and work in an environment that is sustainable, leaders need to work harder to lead by example. That means fighting against discrimination and ensuring females keep striving towards leadership, as well as cheaper congresses, and supporting surgeons, scientists, healthcare with training, education and activities. There also needs to be more support towards minorities and disadvantaged cardiologists.

Based on research and individual views, it is clear a number of regional and gender differences have been uncovered culturally in the working place within cardiologists, but also within healthcare as a whole. The results dispel a mixture of factors which may hinder the careers of women or minority, but more importantly, hinder both male and female's lives.

Both men and women find it difficult to reconcile personal life – both aspire to better training, support, higher standards, better leadership and vision. Senior and heads of departments need to listen and should take this into account and have a better vision.

The ESC for example have invested in leadership training and also introduced new opportunities, such as training and negotiation skills. This is particularly important for heads of departments, who evidently play a part in helping others. Initiatives like this need to continue, if the issue of burnout is to be reduced.

A strong investment on setting standards and certification and trying to define centres of excellence needs to be put in place – how they do/what they do/what they do with their staff/training and continuing medical education – not so much in the north but other areas of Europe.

Conclusion

What's clear is that burnout is not just about women or the minorities, it is about how both men and women in a community feel as a whole and how the notion of burnout is felt everywhere. Leaders need to make more effort and help prevent the victimisation of physicians and cardiologists. A new culture of medicine needs to be put into place. ∎

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SUSTAINABILITY

IS HEALTHCARE READY?

Our healthcare system has a role in both adaptation and mitigation. To anticipate and prepare for climate-related health threats, we need acute capacity for managing extreme weather-related events. Much of our health infrastructure is ill-prepared for these events, as became clear after Hurricanes Katrina and Sandy. As for mitigation, healthcare facilities are among the most energy-intensive forms of commercial space, accounting for an estimated 8 to 10% of U.S. greenhouse-gas emissions.

Source: Preventive Medicine for the Planet and Its Peoples. https://iii.hm/eog

HOW HEALTHCARE PROFESSIONALS CAN LEAD CHANGE ON CLIMATE CHANGE SOLUTIONS

- Become climate literate
- Relate climate to patient and client health
- Be vocal, model leaders within your communities
- Elevate your voice on climate within your professional community
- Take your climate leadership national

Source: Let's Talk Health and Climate: Communication Guidance for Health Professionals. https://iii.hm/eoh

TACKLING THE CORE ISSUES

In recent years, we've learned that certain products we use in healthcare, including furniture, fabrics, and building materials, contain toxic chemicals that can leach and have adverse effects on human health and the environment.

WHAT WE CAN DO

- Ensure the use of safer products to create healthier healing environments.
- Promote healthier, more sustainable food, support local farms and producers and increase the consumption of fresh, healthy food.
- 2017 in the US has seen 62% have a policy to aid sustainable food while more than 70% of hospitals reported purchasing foods that have been locally and/or sustainably grown.

Source: How Health Care Is Pushing Sustainability Ahead of Consumer Demand. https://iii.hm/esb

CONSUMER DEMAND FOR SUSTAINABLE CARE

- Expand healing mission beyond hospital walls.
- Connect a healthy environment to patient experience and show how facilities can optimise healing: from a human health, community and environmental perspective.
- Promote happiness in the workplace to ensure a positive environment for staff to work in.

Source: How Health Care Is Pushing Sustainability Ahead of Consumer Demand. https://iii.hm/esb

ECONOMICS OF HEALTHCARE: WHICH COUNTRIES ARE GETTING IT RIGHT?

Norway, Switzerland and the United States are the world's three biggest healthcare spenders. But other countries' health systems, Hong Kong, Israel and Singapore are managing to achieve similar or better results for far less. Efficient healthcare systems feature a strong primary care system and technology to contain costs.

WHAT ABOUT THE LEAST COST-EFFECTIVE HEALTH SYSTEMS?

Countries that have high healthcare spending with underwhelming health usually have misallocated resources. This could mean either to a particular section of society (leaving another section without) or to particular kinds of service (usually hospitals) sucking up the funding that would be better spent elsewhere. Examples include South Africa, Russia and the U.S.

Source: Which countries have the most cost-effective healthcare? https://iii.hm/eoi

Crises in health sector and pharmaceutical companies

A crisis action plan is necessary to avert negative fallout

Most companies have done little in the way of preparation for crisis. The following exciting hypothetical scenario can help put matters right.

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Many health sector firms do not have proper crisis management plans. They might have a plan for the more tangible aspects such as an IT failure or having to evacuate the office. They will probably have a PR or communications adviser. But, from experience, they are unlikely to have knitted all aspects together in one document. In effect, they will lack a holistic plan that covers all contingencies – both operational and reputational.

To that end, the CEO and top team will be relying on their ability to see the potential for things going wrong and reacting in good time. But this depends on employees at all levels being able to spot a potential crisis and trusting the system and their management sufficiently to elevate their concerns quickly and to the right people. Otherwise an incident can rapidly spiral out of control and become a full-blown crisis. Then, without a plan in place that allows for an organised response, it may not be possible to get off the back foot.

Scenario planning

One way to test this assumption is through scenario planning, a well-honed training tool in both the army and academia. In this article, we will walk you through a fictitious incident based on a compilation of real-time events. Through this scenario we pose some questions you might well ask if you were helping to manage this hypothetical situation. We then provide some conclusions that should guide both preparation and response. (It's important to note that none of the events described in this article bear any resemblance to actual events in association with the places and institutions mentioned. They are named and described for illustrative purposes only).

The scenario

Waguluu PLC is a biotech company that grows human tissue for wound care and other healing applications. The company was started in 2007 as part of the National Institute of Health Research (NIHR) Cambridge Biomedical Research Centre. Its scientists and post-graduate

researchers came from the biological science department at Magdalene College. Its commercial potential grew rapidly and it went public on the London Stock Exchange in 2010.

By 2012 the company already had a product approved by the US Food and Drug Administration (FDA) and the European Medicines Agency (EMA), with a second approval pending. Many of the company's investors have been in the stock since it went public because they believed in the promise of the technology and its healing potential. A number of its institutional investors, including the Universities Superannuation Fund which has many billions under management and is one of the largest pension schemes in the UK, have strict rules regarding ethical investing.

Last month, Waguluu's public profile rose, with a front-page story in the Financial Times and a slot on the BBC's Newsnight, when it became the poster-child in the new "Britain is Open for Business" promotion campaign for the fast-growing bio-medical field.

> ❝ MOST HEALTH SECTOR FIRMS LACK A HOLISTIC PLAN THAT COVERS ALL CONTINGENCIES – BOTH OPERATIONAL AND REPUTATIONAL ❞

Waguluu is currently running human trials for a new product, Bandex, a spray dressing that creates a new skin within hours on severely burnt patients who are considered too high risk for surgery. The trials are being run at several hospitals in the EU, including the Hospital Kaspella and the Surgical Centre Trimontium in Plovdiv, Bulgaria.

Waguluu's CEO, Professor Sir John Morton - professor of cell biology and master of Magdalene College 1995-2003, and this year's Nobel Prize winner for medicine - is scheduled to address the European Medical Physics and Engineering Conference in Sofia, Bulgaria, later this month. The conference is to be hosted by the Bulgarian Society of Biomedical Physics and Engineering.

Phase 1 - A friendly email raises a red flag

You are a key member of the CEO's top team in Waguluu PLC. A close friend of yours in Sofia, someone you knew in your university days in the UK who now closely follows your work at Waguluu, has sent you an email with a link to the highly-respected Center for the Study of Democracy which has released a new study on corruption in the medical sector in Bulgaria (Center for the Study of Democracy 2017), as he knows you plan to visit Bulgaria in December for a conference.

In the email your friend also mentions that he has noticed a fair bit of traffic on Twitter in Bulgaria; there

seems to be a public outcry about the mysterious cause of death of a half-dozen or so people in Plovdiv, Bulgaria's second city, who were brought to hospitals there with severe burns following a gas explosion in an industrial plant nearby. He ends his note to you with the rather quizzical comment: 'Hey, I thought that new product of yours was supposed to patch things up?' Questions:

- Who in the company do you alert?
- Should the crisis management team (CMT) be assembled? Who is on the team?
- Do you have a crisis management plan to guide you?
- What are the key questions you and your top team colleagues are asking at this point?
- Should the number of people in the company with knowledge of the possible crisis be limited? If so, how?
- Should a media blackout be imposed?
- Considering your friend mentioned Twitter, what is the company's approach to social media?

Phase 2 - One week later Bandex becomes a big bother

The Medical Examiner's report on the deaths from the fatal gas explosion reveals that a number of people who died from their severe burns did so because of infections that set in after a spray dressing was used for bandaging. You find out from Waguluu's clinical division that Bandex was used on some of the patients. The report is mentioned in the local Bulgarian press but it does not mention the product name Bandex. Questions:

- How – and to what extent – should the CMT be kept apprised of Waguluu's own investigation into the Bulgaria situation?
- Do you inform shareholders that there are problems with trials of Bandex?
- What should employees be told? How can what they may communicate outside the company be controlled?
- Under what legal or ethical obligations should the FDA, EMA and London Stock Exchange be informed of the Bandex issues?
- What proactive steps should be taken with the media at this point?
- What proactive steps should be taken with stock analysts at this point?

Phase 3: One week later: corruption adds insult to injury

The Bandex problems are now out in the open and your stock price has fallen precipitously, though management is confident Waguluu's basic technology is sound. But today you receive an email from your agent in Sofia saying that the director of the hospital in Plovdiv has been suspended from his post due to allegations of corruption as part

of an ongoing investigation by the chief prosecutor's office at the Ministry of Justice. Four months earlier, your CEO met this hospital director when he was on a visit to your company's lab in Cambridge as part of a European hospital directors' tour, all paid for by Waguluu. Questions:

- Should your CEO, Professor Sir John Morton, go as planned to address the European Medical Physics and Engineering Conference in Sofia, Bulgaria?
- Are you as a key member of the CEO's top team well-versed in Waguluu's ethics practices and compliance with the UK Bribery Act and the US FCPA? Who can act as spokesperson on these issues?
- At this point, how should media, analysts and investors be dealt with?
- What groundwork can be done to begin rebuilding Waguluu's reputation?
- Based on your discussion of this scenario, how much emphasis should your own company put on crisis preparedness? What kind of planning and practice are needed?

Remember:

- Never say anything definitive unless you are absolutely sure that you know the truth – take nothing for granted
- Remember that major crises are nearly always caused by coincidences of several contributing factors, of which your company may be only one
- Remember that there may be a public inquiry or hearing, or a civil or criminal court case, that will scour in minute detail every word that you say, every email you write and every action you take
- It is vital to say something at the earliest possible opportunity in the face of publicity or possible publicity. The vacuum created by the failure to communicate will quickly be filled with rumour, misrepresentation, gossip and poison
- When it comes to giving information, there should be a presumption of openness. The question should be: "Is there any good reason why we shouldn't reveal this?" rather than: "Do we really need to tell them this?"
- A spirit of openness and honesty will always enhance your reputation. Any suspicion that facts are being hidden will do the opposite
- Your message should show concern, action and reassurance. Concern reflects a company's values and priorities: (1) people; (2) environment; (3) property; (4) business reputation. It is acknowledging or understanding points of view of protestors and showing sympathy for families, or about recognising the hurt or inconvenience a community may have suffered. Action is about what will happen next – an investigation to find out what went wrong and steps the

company is taking to correct or clean up the damage, to close down a facility, to bring in a back-up until full service can be restored. Reassurance means saying the lessons will be learned – and that you have a contingency plan in place.

In short, in order to implement a crisis action plan, the following are necessary:

- Having a prepared mind is the most important principle. Embed the ethos. Think through the possibilities
- Listen to what stakeholders are saying – and then get the message right – quickly
- Have contextual awareness – put things in perspective relative to the local culture and politics
- Have a validated policy which is understood and rehearsed. Don't overcomplicate or over-template it (there will never be a "black book" for every situation). And just because you have extant procedures, never get complacent
- Get the right people together quickly, ensuring that they know their roles before a crisis
- Be timely, get the facts and ensure the passage of information. But accept that you will have to take some early decisions without knowing everything (that's where judgment is so important)
- Act early and decisively, and don't be reluctant to say that you have a crisis (it's easier to de-escalate in a timely way than to escalate too late in the day). ∎

KEY POINTS

✓ Many health sector firms do not have proper crisis management plans

✓ Without a comprehensive plan in place that allows for an organised response, it may not be possible to mitigate the situation

✓ One way to test this assumption is through scenario planning, a well-honed training tool in both the army and academia

After three decades of crisis resolution, **John Deverell CBE** created his own company, Deverell Associates advising on leadership, governance, crisis preparedness and business continuity. John was previously Director of Defence Diplomacy in the UK Ministry of Defence and subsequently on the Executive Leadership Team of Invensys plc, a FTSE-100 global technology company.

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Healthcare risk, quality & safety guidance

Violence in healthcare facilities

In the below summary, ECRI discusses violence in healthcare covering risk factors, assessment of objective indicators, consequences, and strategies for prevention.

Executive summary

Violence is much more common in healthcare than in other industries, and although many violent events in healthcare are perpetrated by patients, a notable percentage are not.

Individuals other than patients who may cause violence in healthcare settings include family members of patients and other visitors, employees, and criminals. Many factors contribute to violence in healthcare: patients and their loved ones are often vulnerable and, at times, distraught, healthcare workers must function in typically stressful environments, there is 24-hour access to the hospital

> **THERE ARE MANY WAYS TO REDUCE THE POTENTIAL FOR VIOLENT OCCURRENCES AND TO MINIMISE THE IMPACT IF VIOLENCE DOES OCCUR**

setting, and the presence of drugs can make healthcare settings attractive targets.

Violence in healthcare may take a variety of forms, ranging from verbal aggression to physical assault, including the use of deadly weapons against physicians, other workers, and patients. It is therefore associated with a variety of risks for patient and worker safety as well as organisational liability. In addition to physical harm, individuals who experience or witness violence in the healthcare workplace are at risk for emotional consequences that can lead to time away from work, burnout, job dissatisfaction, and decreased productivity.

These and other consequences compromise both worker and patient safety.

Healthcare employers are obligated to provide a safe working environment free from recognised hazards, and failure to effectively abate the risk of violence can result in losses including fines, claims, litigation, and reputational damage.

However, employers' prevention efforts may be stymied by failure of victims to report violent incidents, because many healthcare workers consider violence "part of the job."

Violent events can and do happen, and being unprepared is unacceptable. Although it is difficult to completely eliminate violence in healthcare settings, and although there is no "one-size-fits-all" approach for prevention, there are many ways to reduce the potential for violent occurrences and to minimise the impact if violence does occur. Risk managers committed to decreasing risk of violence in their organisations will need to convene stakeholders from various disciplines and collaborate to implement strategies, individualised according to identified risks, across the organisation.

The issue in focus

When violence erupts in a healthcare facility, the consequences are many and unpredictable, potentially including injury or death of building occupants, property damage, lawsuits, and diminished patient, staff, and community trust.

The risk of workplace violence looms in healthcare facilities—where a stressful work environment can quickly become volatile, visitors may be highly emotional, and drugs or expensive equipment may become targets of robbery. In addition, home care employees may walk alone into homes where patients or their family members keep weapons or drugs or may visit homes in areas with high crime

rates, increasing the risk of encountering violence while on the job.

The National Institute for Occupational Safety and Health defines workplace violence as "violent acts, including physical assaults and threats of assault, directed toward personnel at work or on duty." Many other sources include verbal aggression (e.g. threats, verbal abuse, hostility, harassment) in the definition of workplace violence. Not only can verbal aggression cause significant psychological trauma and stress, it can also escalate to physical violence.

Incidence

The Occupational Safety and Health Administration (OSHA) reports that in each year from 2011 to 2013, U.S. healthcare workers suffered 15,000 to 20,000 serious workplace-violence-related injuries; serious injuries are those that require time away from work for treatment and recovery.

Violence is significantly more common in healthcare than in other industries, such that violence-related injuries to healthcare workers account for almost as many similar injuries sustained by workers in all other industries combined. In 2013, healthcare and social assistance workers experienced 7.8 cases of serious workplace violence injuries per 10,000 full-time equivalents (FTEs), while other large sectors such as construction, manufacturing, and retail all had fewer than two cases per 10,000 FTEs.

Additionally, in 2016, the U.S. Government Accountability Office (GAO) published an analysis of three federal datasets revealing that in 2013 healthcare workers at inpatient facilities such as hospitals experienced injuries from workplace violence that required time off at a rate that was five times that of overall private-sector workers.

According to OSHA, individuals other than patients, including visitors and coworkers, cause 20% of violent incidents in healthcare.

Organisational Perspective
Risk Factors
Healthcare workers face serious risks. The following risk factors for violence are inherent to the provision of healthcare:

- Setting-specific vulnerabilities of acute care hospitals, emergency departments (EDs), community health clinics, drug treatment clinics, long-term care facilities, and private homes
- Isolated work conducted alone or in small groups, in remote areas, or in areas with high crime rates
- Late night or early morning work hours
- The "economic realities of healthcare," such as reduction in staff, increased productivity

pressure, patients and visitors who are experiencing difficult personal or financial circumstances
- Exchange of money with the public
- Transport and delivery of passengers, goods, or services.

High-Risk Areas
Certain clinical areas are particularly vulnerable to violence perpetrated by a family member or visitor.

Emergency Department (ED): Several factors predispose the ED to violence. As the main route of public access into the facility, EDs are often under-staffed and overcrowded. The American College of Emergency Physicians cites the following factors that increase the risk of violence in EDs:

- Presence of gangs
- Long wait times for care, sometimes in undesirable environments
- Influence of drugs and alcohol
- Private citizens arming themselves
- Presence of individuals requiring "medical clearance" after an arrest by law enforcement
- Presence of individuals requiring psychiatric support in absence of sufficient dedicated mental health facilities

In one survey, more than 75% of emergency physicians reported experiencing at least one incident of workplace violence per year. Nearly as many emergency nurses reported verbal or physical assault by patients or visitors.

In a study of ED resident physicians published in 2016, in addition to reporting varying levels of violence perpetrated by patients, subjects reported experiencing the following types and rates of violence perpetrated by visitors:

- Verbal harassment: 86.6%
- Sexual harassment: 21.8%
- Physical violence: 11.8%

Perhaps not surprisingly, nearly a quarter of the residents surveyed reported feeling safe at work "occasionally," "seldom," or "never."

Women's healthcare
Women's healthcare, including labour and delivery and the maternal-child health unit is a high-risk environment owing to the emotionally charged issues surrounding pregnancy and childbirth.

Intensive care unit (ICU)
Because the ICU cares for the most seriously ill patients, visitors to this area may be extremely distraught, stressed, and demanding of staff attention, which may—or may appear to be—in short

supply. This combination can lead to verbal aggression toward staff and can escalate into physical assault, especially if staff are not properly trained in responding to distraught visitors.

Neonatal or paediatric ICU

Concerned parents may become violent while waiting to talk to a physician, while waiting for test results, or after finding out that their child has a serious disease. Divorced or estranged parents may come into conflict over their child's care in nurseries or on paediatric floors. Custody disputes may spill over into the hospital.

> 66 FAILURE TO EFFECTIVELY ABATE THE RISK OF VIOLENCE CAN RESULT IN LOSSES INCLUDING FINES, CLAIMS, LITIGATION, AND REPUTATIONAL DAMAGE 99

Parking lots and other exterior areas

Several factors can contribute to a parking area becoming the scene of violence. Parking areas may be dark, may offer many hiding places, and may be deserted at certain hours.

Home care

Home care workers, who often must enter patients' homes alone, are particularly vulnerable to violence. Home care workers may be exposed to unsafe conditions and have reported feeling threatened when they know that loaded weapons are present in a patient's home, or that drive-by shootings or gang violence have occurred in the neighbourhood.

Rats, other vermin, or hostile animals may be present, or housing may be in a deteriorated condition, or other situations may exist that suggest the potential for physical violence, verbal abuse, or sexual harassment by patients, family members, or visitors.

Action Recommendations

- Develop and enforce comprehensive policies and procedures against workplace violence
- Evaluate objective measures of violence to identify risks and risk levels
- Train staff to recognise the warning signs of violent behaviour and respond proactively
- Establish a comprehensive workplace violence prevention programme

ECRI Institute, a nonprofit organisation, dedicates itself to bringing the discipline of applied scientific research in healthcare to uncover the best approaches to improving patient care. As pioneers in this science for nearly 45 years, ECRI Institute marries experience and independence with the objectivity of evidence-based research.

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

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

For access to the full Violence in Healthcare Facilities Report, go to: **https://www.ecri.org/components/HRC/Pages/SafSec3.aspx**

- Encourage all employees and other staff to report incidents of violence or any perceived threats of violence
- Ensure appropriate follow-up to violent events, including communication, post-incident support, and investigation
- Ensure that the violence prevention programme addresses the possibility of gun violence, including active shooters ∎

Building a new culture of safety

Providing employees with the right environment and skills

Human factors such as authority gradients are important barriers to safety event reporting in healthcare and warrant implementation of specific countermeasures and cultural change.

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Introduction

Safety event reporting is the cornerstone of all quality assurance and improvement efforts. Electronic reporting into databases is possible for many systems issues, however many safety concerns have to be reported verbally in the moment when patient safety is at immediate risk.

It has been well established that verbal reporting of safety concerns is subject to significant barriers and therefore frequently does not occur. The rate of not speaking up about a safety event, once an issue has been identified, ranges from 40% in the airline industry (Wheale 1983) to 90% in the healthcare industry (Maxfield et al. 2005). The most recognised barrier is an authority gradient between staff working together. Additional human factors include fear of retribution, fear of disrespect, fear of a "toxic captain" (an individual that is difficult to work with), a high reporting threshold, understanding safety as everybody's responsibility, lack of listening, and lack of language training.

In its recent sentinel event alert (The Joint Commission Sentinel Event Alert 2017) The Joint Commission underscored the importance of a culture of safety where all staff can report safety events without fear of consequences and are actively recognised for bringing safety concerns to somebody's attention. This article discusses human factor barriers to safety event reporting and provides suggestions on how to overcome them.

Fear of the "Toxic Captain"

The toxic captain is defined as a person who creates an uncomfortable work environment, who sets a negative tone around them, does not appreciate the talent and skills of others, does not listen to feedback and is unable to collaborate. The term originated in the airline industry where it has been identified as a safety risk which also applies to healthcare.

Removal of this barrier requires organisational commitment to high standards of professionalism for all staff and developing systems for intervention and remediation. Encouragingly, work on professionalism has shown that behavioural change in individuals is

possible sometimes with as little as a single conversation. Raising awareness about this issue has allowed 65% of staff to reverse their behaviour (Hickson et al. 2002).

Lack of language training

While lack of language training is often reported as a minor barrier acknowledged by 2-29% of staff to interfere with speaking up, it does play a major role in clinical practice. St. Pierre et al. showed that safety issues that can be solved by action not necessitating verbal interaction are much more likely to be addressed than those that require a verbal communication (St. Pierre et al. 2012). In addition, only a fraction of verbal communications (11%) are unambiguous and pursued, i.e. clarified or repeated until the receiver has fully understood and recognised the concern. Most verbal communications are vague, only hinting at the issue, or even though the problem is stated clearly, it is only brought up once and not pursued if the receiver does not react to the message.

This language barrier can be addressed with the development of five-step language scripts that facilitate unambiguous communication:
1. The communication is initiated by addressing a specific person directly by name
2. The sender then states the observation without value judgement
3. The sender states the concern that she/he has arising from this action
4. She/he continues by proposing a different action
5. She/he asks for the receiver's opinion

Understanding patient safety as a common responsibility

Approximately one third of frontline staff do not consider patient safety a part of their work assignments, and are under the impression that the attending physician staff solely carry the responsibility for this aspect of patient care. While there is no doubt that the attending physician is ultimately responsible for a patient's safety, it is important to recognise that physician attending staff as human beings are vulnerable

to distraction, information deficit, and misunderstandings. Therefore, physicians and other team leaders need support from everybody on the team to provide additional potentially important information.

Removal of this barrier requires explicitly making patient safety a responsibility shared by everybody. This new understanding could be included in the organisation's mission statement, code of conduct and performance evaluations. Recognising staff who have demonstrated exemplary efforts in this regard, raises the overall awareness for this important task.

> **" APPROXIMATELY ONE THIRD OF FRONTLINE STAFF UNDERSTAND PATIENT SAFETY AS A RESPONSIBILITY OF THE ATTENDING PHYSICIAN "**

Fear of retribution

This barrier is well recognised in the literature and has been reported as the cause for not speaking up in 70% of safety events occurring in the manufacturing industry (Ryan et al. 1998). Specific fears include fear of receiving less desirable work assignments, not being considered for promotion, not getting a good letter of recommendation, and fear of losing one's job.

Transparent processes have to be created to counteract these fears. Transparency around work assignments and vacation time requests will offset the human tendency to search for causal connections between events, that may not necessarily be related. Along similar lines, team leaders have to be aware of their own body language and tone of voice when answering to safety events being brought up. For example, a harsh tone or abrupt body language due to stress on the manager's part may be misinterpreted as "having done something wrong" or "having offended the team leader" which would reinforce concerns for retribution on part of the sender. Transparency about causes for the team leader's response will help prevent misunderstandings and avoid mixed messages.

Lack of listening

This has been identified as a barrier by more than 50% of staff. Listening is a complicated part of the communication process that is divided into five different components (Devito 2016): receiving, understanding, remembering, evaluating, and responding. Interruptions can occur at any stage by distraction due to physical noise, inability to share one another's meaning, reconstructive memory, bias, prejudice and assumptions, and lack of immediate feedback.

Removal of this barrier may be possible by instituting a practice of active listening:

1. Listening to what is said,
2. Rephrasing what one has heard,
3. Asking questions for clarification and
4. Obtaining confirmation that what was understood is correct.

Fear of disrespect

Disrespect in the workplace has risen over the last decades from 25% in 1998 to 90% in 2015. The impact of disrespect on performance is dismal: staff who experience disrespect demonstrate a 61% decrease in performance and a 58% decrease in creativity. But not only does disrespect influence the person at whom it is directed, it also negatively influences all those who witness it, decreasing performance by 22% and creativity by 28%.

To create a respectful work environment, it may be helpful to specifically review respectful and disrespectful behaviours with all staff (Meshanko 2012) and include behaviours supporting a culture of respect in the organisational code of conduct. A powerful starting point in the journey towards building a more respectful work environment can be the simple practice of thanking staff for bringing a safety issue to the attention of team leaders. This expresses respect and reassures frontline staff that bringing up safety concerns is valued by team leaders.

Challenging authority

The concern to challenge somebody in authority is common ranging from 40% in the airline industry to 90% in healthcare. It is worthwhile considering where the perception of challenge originates: from the content of the message, the way the message is delivered or the beliefs of the sender/receiver? The content of the message should not contribute, it merely contains important information that the receiver may need and may be unaware of. The way the message is delivered may contribute, if the message is phrased in an accusatory or offensive fashion, pointing out that an error is about to be made or expressing doubt about the competency of the team leader. However, the sender's and receiver's beliefs likely contribute the most to a perception of challenge: the receiver may automatically perceive any safety issue that is brought up as a comment on her/his lack of competency and the sender may fear that her/his message would be misunderstood that way.

Therefore, cultural change is needed for everybody to understand the calling out of safety issues as a positive event that ensures the patient's safety and ultimately the success of the healthcare team. Team

leaders no longer need to perceive a challenge to their authority and senders no longer need to be afraid to be misunderstood.

Reporting threshold

Most staff only consider bringing up a safety concern when they are entirely sure that their observation is correct and that their concern is justified. Maybe this is not surprising in today's medical culture. Its high technical development offers treatment for many diseases that were previously considered incurable and patients' expectations are high. The fact that somebody "does not know something" is incongruent and therefore perceived as unacceptable. However, with the exponential growth of medical knowledge over the last decades, the expectation that health care staff/physicians are all knowing is unrealistic: medical knowledge currently doubles every three years and by 2020 is expected to double every 73 days.

> **DISRESPECT IN THE WORKPLACE HAS RISEN OVER THE LAST DECADES FROM 25% IN 1998 TO 90% IN 2015**

As a profession we have to come to a new cultural understanding, reassuring staff that it is acceptable not to know something, and encouraging a low reporting threshold with everybody sharing uncertain observations in order to improve patient safety.

Conclusion

Establishing a new culture of safety where all employees are enabled to speak up, requires providing employees with additional skills as well as changes in the work environment. Additional employee skills include learning to follow language scripts, active listening skills, and understanding safety as a responsibility shared by all. Cultural changes require creating a work environment based on mutual respect, instituting a non-hierarchical team structure in regards to safety and encouraging a low reporting threshold. ∎

KEY POINTS

- ✓ 40-90% of employees' experience barriers to safety event reporting that keep them from speaking up about safety concerns

- ✓ The most common barriers to speaking up in healthcare are high reporting thresholds, authority gradients, and fear of disrespect

- ✓ Additional barriers include lack of listening, fear of retribution, not understanding safety as a responsibility shared by all, lack of language training, and fear of an individual creating an uncomfortable work environment ("toxic captain")

- ✓ Establishing a new culture of safety where all employees are enabled to speak up, requires providing employees with additional skills as well as changes in the work environment

- ✓ Additional employee skills include learning to follow language scripts for speaking up, active listening skills (particularly for team leaders), and understanding safety as a responsibility shared by all

- ✓ Cultural changes require creating a work environment based on mutual respect, instituting a non-hierarchical team structure in regards to safety and encouraging a low reporting threshold

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Effects of an internal and participatory intervention

Improving the radiological image

Prof. Rui Almedia gives an analysis on his research which was applied to general radiology exams.

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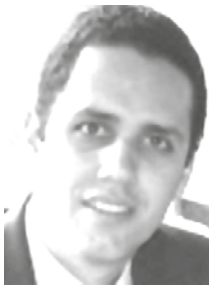
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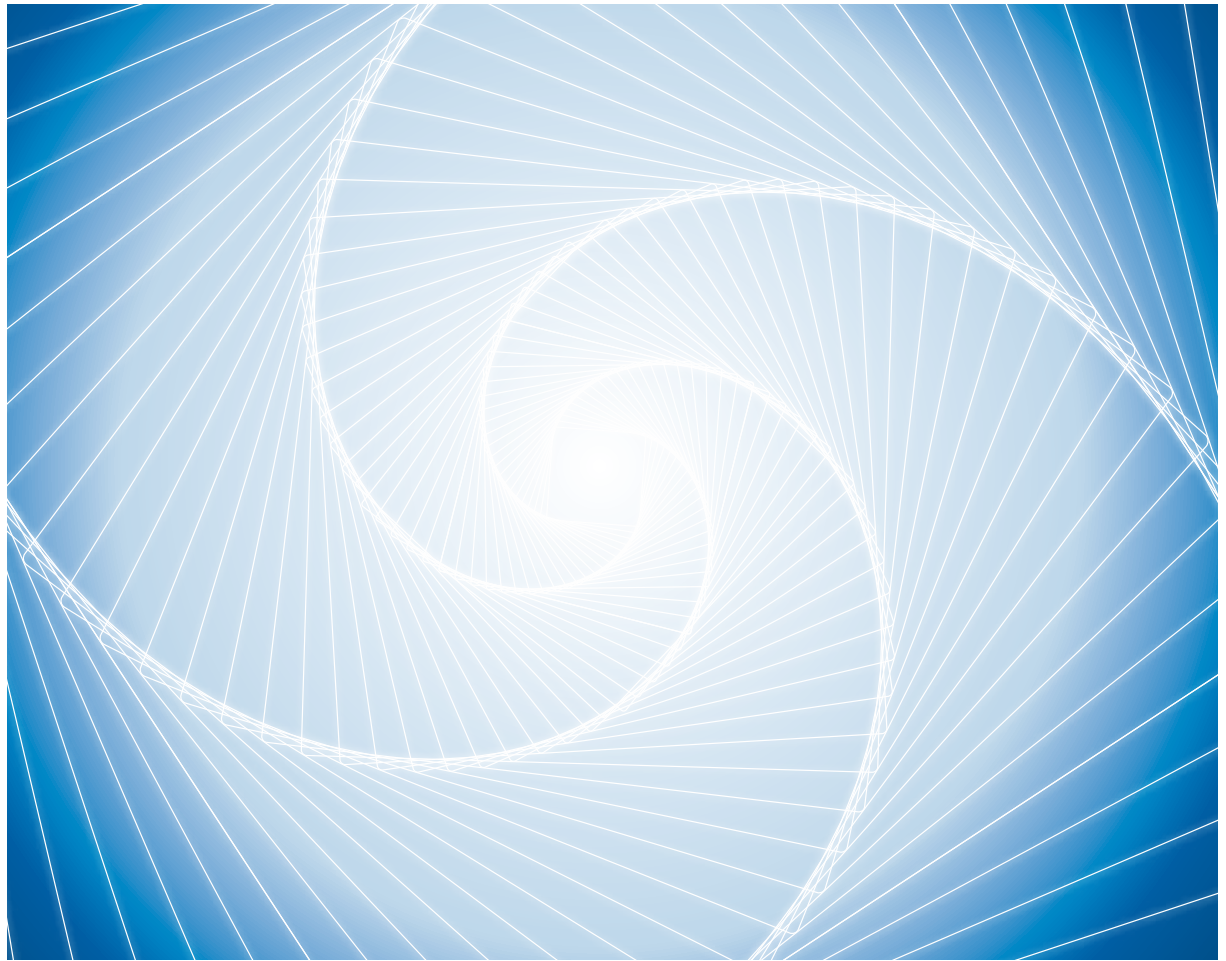
The main goal of this research was to assess the effect of an internal and participative intervention aimed through the implementation of best practices and quality improvement applied to general radiology exams. Therefore, a quality improvement cycle was conducted in a radiology department considering a total of 5 criteria and 13 sub-criteria of quality assessment. At baseline, 11 of the criteria/sub-criteria presented quality failures but during the revaluation the improvements were significant in 8 of the criteria/sub-criteria. So, the internal quality assessment cycle has

been useful and effective as a routine tool for continuous quality improvement of the healthcare process.

The access to healthcare services has increased worldwide, but the quality of care provided to the patients still is a global health challenge (Scott et al. 2014). In this context, an imaging department (public or private), has a great importance in a networked organisational structure, since its contribution to the clinical diagnosis is crucial in most cases (Macedo and Rodrigues 2009; Almeida et al. 2010). Thus, the need to provide better healthcare services to patients

goes through the implementation of quality management programmes, defined as "the set of structural elements and activities which specific purpose is the continuous quality improvement" (Saturno 2008; Juran et al. 1990).

Three main starting points can be identified in quality management programmes aiming the continuous quality improvement of the radiology departments, in particular, 1) quality improvement cycles, 2) quality monitoring and 3) quality planning (Saturno 2008; Palmer 1990). In the specific case of quality improvement cycles, they start with the identification of an opportunity for improvement (quality problem) in some aspect of the offered services, with the purpose of "taking advantage" of the opportunity to improve or "solve" the identified problem (Saturno 2008; Juran et al. 1990; Figueiredo and Gama 2012).

The quality of the product/service provided in a radiology department consists on "obtaining precise/accurate diagnostic information with the lowest dose of exposure to all hazardous factors that is reasonably achievable and at a minimal, realistic cost." (Erturk et al. 2005). So, repeat exposures should be avoided due to poor image quality, because it increases the risks to the patient and the costs to the department, and, at the same time, can reduce the accuracy of image interpretation, and may even result in dissatisfaction among patients, workers and the institution itself (Erturk et al. 2005; Felício and Rodrigues 2010).

General radiology procedures continue to be the one with the highest number of examinations performed worldwide (around 3.6 billion examinations per year) and is expected to continue to increase due to the introduction of new digital technologies and the increase in the number of equipment (UNSCEAR 2008; Teles et al. 2012). Thus, we should have a concern with the quality of this procedures, especially with the image quality and the technical parameters, through their optimisation, since they influence the quality and also the patient safety.

Therefore, considering that the general strategic lines of a radiology department must ensure processes that correspond to the patient needs, performed according to the best available scientific evidence, and to develop a culture of continuous improvement through teamwork and the involvement of all department stakeholders, the present study consisted in evaluating the effect of an internal and participative intervention to implement the best practices and improve the quality applied to general radiology examinations. In order to achieve this goal, a quality improvement cycle directed to the radiological image was carried out in order to maximise its quality based on criteria and interventions defined by the radiographers themselves.

Materials and methods:

Based on a quality improvement cycle with a quasi-experimental design before-after, following the SQUIRE (Standards for Quality Improvement Reporting Excellence) guidelines, six sequential methodological steps were developed in a public radiology department in Portugal (Taylor et al. 2013; Portela et al. 2015):

1. Identification and prioritisation of the quality problem: 6 radiographers performed a qualitative analysis using the nominal group technique adapted with two other techniques: 1) brainstorming on the possible problems and 2) preliminary and final voting using a prioritisation matrix focused on the following criteria: problem frequency, gravity, dependence on internal efforts to solve it and solution costs. The quality of general radiology exams was prioritised.

> ❝ THE NEED TO PROVIDE BETTER HEALTHCARE SERVICES TO PATIENTS GOES THROUGH THE IMPLEMENTATION OF QUALITY MANAGEMENT PROGRAMMES ❞

2. Analysis of the problem causes: A cause-and-effect diagram and a qualitative analysis of all potential causes of the prioritised problem were performed. This study was focused only on the measurement of the causes in which there was scientific evidence of its relation to the problem and that would allow to develop criteria and indicators to measure quality.

3. Development of quality criteria: A group of 4 experts in the radiology field developed a list of quality criteria and sub-criteria related to the image quality of general radiology, using a format that included its definitions, exceptions and clarifications. Face, content and criterion-related validity were analysed and considered adequate for all the criteria. Moreover, through a pilot study and using a sample of 30 exams and 2 independent evaluators, all criteria were identified with consistent reliability (general agreement observed above 95% for all criteria).

4. Evaluation of the quality level: Systematic random samples and convenience samples (n=60) were used considering a total of 5 criteria and 13 sub-criteria of quality assessment. Data were collected

Table 1: Compliance with image quality criteria of general radiology examinations before and after the improvement intervention (p1 - percentage of compliments in the initial evaluation; p2 - percentage of compliments in the revaluation).

Quality Criteria	Initial Evaluation p1 (C.I. 95%)	Revaluation p2 (C.I. 95%)	Absolute Improvement p2 – p1	Relative Improvement p2-p1 / 100-p1	p-value
1. Clinical information	50,0 (± 12,7)	66,7 (±11,9)	16,7	33	0,031
2. Metallic artifacts	80,0 (± 10,1)	91,7 (±7,0)	11,7	59	0,033
3.1. Positioning	100,0 (± 0,0)	100,0 (± 0,0)	0	0	-
3.2. Source to image distance	88,3 (± 8,1)	96,7 (± 4,5)	8,4	72	0,040
3.3. kV	75,0 (± 11,0)	86,7 (± 8,6)	11,7	47	0,052
3.4. mAs	98,3 (± 3,2)	100,0 (± 0,0)	11,7	100	0,156
3.4.1. Automatic exposure control	91,7 (± 7,0)	93,3 (± 6,3)	1,6	19	0,371
3.4.1.1. Ionization chambers	91,7 (± 7,0)	93,3 (± 6,3)	1,6	19	0,371
3.5. Focal spot	83,3 (± 9,4)	90,0 (± 7,6)	6,7	40	0,140
3.6. Anti-diffusion grid	91,7 (± 7,0)	96,7 (± 4,5)	5	60	0,121
3.7. Collimation	100,0 (± 0,0)	100,0 (± 0,0)	0	0	-
4. Diagnostic Reference Levels	76,7 (± 10,7)	95,0 (± 5,5)	18,3	79	0,002
5.1. "S" value	33,3 (± 11,9)	75,0 (± 10,9)	41,7	63	<0,001
5.2. "L" value	75,0 (± 11,0)	91,7 (± 7,0)	16,7	67	0,007
5.3. Radiographer name	68,3 (± 11,8)	88,3 (± 8,1)	20	63	0,004
5.4. Radiographic markers/ indicators	71,7 (± 11,4)	96,7 (± 4,5)	25	88	<0,001

using different data sources according to the analysed criteria. The initiative of the evaluation was decided by the radiographers (internal evaluation), in which they were responsible for the data collection, performing a cross-evaluation.

5. Quality improvement intervention: It was based on a structured and participatory planning method. The ideas generated to answer what should be done to improve the quality of general radiology examinations allowed to distribute, through an affinity diagram, four main groups of actions to be implemented: 1) Radiographers training on "dosimetry and technical parameters to be used according to the anatomical region under study" and "image post-processing", 2) Physicians training on "national and international legislation about the principles of Justification, Optimisation and Dose Limitation" in relation to the prescription of radiological examinations, which should contain adequate clinical information so that radiographers can evaluate, programme and perform these examinations according to the patients clinical situation, in order to obtain the best diagnostic

images, 3) Organisation of work procedures and establishment of standards related to image post-processing and 4) Dissemination of the study results through the elaboration of a storyboard (with the inclusion of the activities progress and awareness-raising actions to monitor the results). After establishing these actions, a Gantt diagram was used to supervise their implementation.

6. Revaluation of the quality level: 18 weeks after the improvement intervention and 24 months after the initial evaluation, a new quality level evaluation was carried out based on the same assumptions expressed in step 5.

Results

Initial evaluation of the quality level

The level of compliance with the quality criteria under study was evaluated for a confidence level of 95% (Table 1) and it was observed that the percentages of compliance in the initial assessment were between 33.3% and 100%. The quality criteria with the highest levels of compliance were the following: "(3.1) Positioning of the patient and the anatomical region under
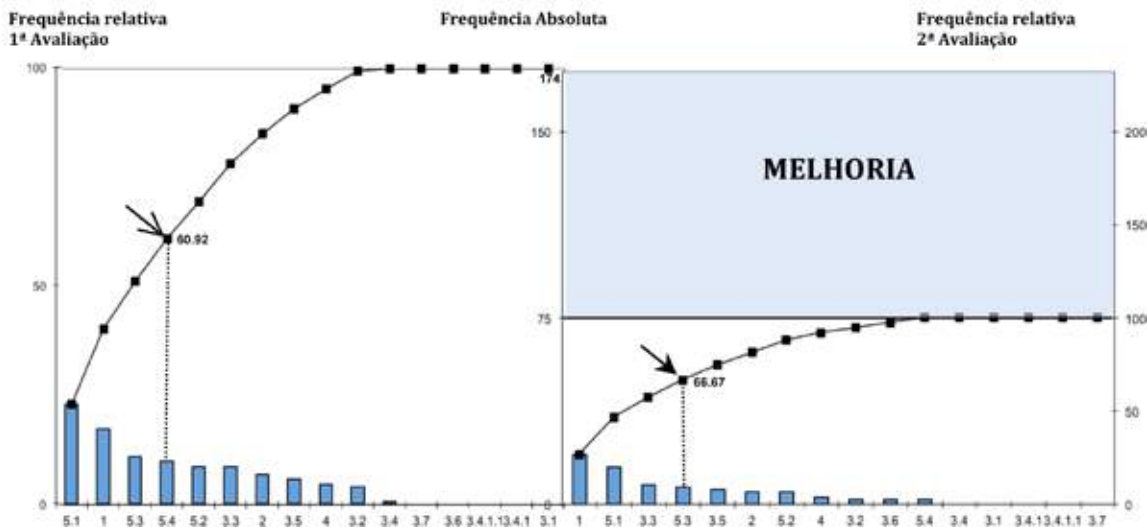
Figure 1

study" and "(3.7) Collimation", both with 100%, and "(3.4) mAs" with 98.3% (C.I 95%, 95.1-100). On the other hand, the quality criteria with the lowest levels of compliance were: "(5.1) Adequacy of the "S" value", "(1) The radiological examination prescribed by the physician should contain adequate clinical information regarding the anatomical region under study" and "(5.3) Inclusion of the initial letters of the name and surname of the radiographer" with compliance rates of 33.3% (C.I. 95%, 21.4-45.2), 50.0% (C.I. 95%, 37.3 -62.7) and 68.3% (C.I. 95%, 56.5-80.1), respectively.

Analysis of quality defects and intervention prioritisation

A Pareto diagram was constructed according to the initial evaluation data, where it was possible to identify the most problematic quality criteria, called "vital few from the trivial many" according to the "Pareto principle". Thus, in the initial evaluation, 4 quality criteria (5.1, 1, 5.3 and 5.4), which together represented 60.92% of the total defects found, were considered as priorities in the actions/interventions to be established to improve quality.

Revaluation of the quality level

After completing the quality improvement intervention plan, there were improvements (absolute and relative) in all quality criteria that had defects in the initial evaluation.

The minimum relative improvement was 19% for quality sub-criteria "(3.4.1) Automatic Exposure Control" and "(3.4.1.1) Ionisation Chambers", and maximum for the sub-criteria "(4) Diagnostic reference levels", "(5.4)

Radiographic Markers/Indicators" and "(3.4) mAs" with 79%, 88% and 100%, respectively.

It was found that improvements in quality levels were statistically significant ($p < 0.05$) in eight of the criteria and sub-criteria. Considering that two of the quality criteria already had 100% of compliance in the initial evaluation, this represents a significant improvement in more than half of the total criteria evaluated.

Considering these data and those in the initial evaluation, it was possible to construct the before-after Pareto graph (Figure 1), where we can observe and compare the values of the defects in the two evaluations performed. It was possible to verify that quality criteria 1, 5.1, 3.3 and 5.3 represented 66.67% of the noncompliance cases verified in the re-evaluation. Thus, in a new intervention planning, these should be the main criteria to be considered in establishing the actions and tasks to be performed, not neglecting all others that still presented defects.

Through Table 1 and Figure 1, we can also observe that the total of quality failures decreased from 174 in the initial evaluation to 75 in the revaluation, which corresponds to an absolute improvement of about 43% (marked improvement area in the Pareto graph).

It was verified for the four quality criteria on which the improvement activities were most important during the intervention, statistically significant improvements ranging from 33% to 88%.

Conclusion

Although the use of quality improvement cycle in healthcare services is still rudimentary, especially in the radiology departments, the quality criteria based

on scientific evidences and the results obtained by assessing their level of compliance, before and after intervention, demonstrated that the internal quality improvement cycle was useful to ensure better image quality through optimised and safer procedures.

Despite the fact that quality culture is still not properly incorporated in the analysed department, the use of this participatory method allowed to open doors to the implementation of quality management internal activities, with the inclusion of all stakeholders. A quality problem has been prioritised, which should continue to be the target of the evaluation cycle, but many others are identified and can be now analysed using the same methodology since the improvements were evident and most of them significant.

The rational intervention, based on data from an evaluation of valid and reliable quality criteria, the voluntary accountability of radiographers, and the audit and feedback of partial results, proved to be useful to improve significantly the quality of this healthcare service.

The development of evidence-based quality criteria has contributed to the improvement achieved, and the fact that the image quality is now higher has contributed to an increase in patient safety by reducing repeat examinations and more favourable conditions for performing better diagnostic imaging.

Despite the good results obtained, the improvement margin is still great. From the four quality criteria on which improvement activities were most pronounced during the intervention, three of them remain the most problematic criteria after re-evaluation, which can be explained in several ways. On the one hand, the other quality criteria have low levels of defects and, therefore, the margin for improvement is much lower. On the other hand, the resistance to change and the technical-scientific knowledge of some radiographers may have influenced the improvement of these criteria, which still have a good margin of progression.

Due to the great variability processes into a radiology department, caution is necessary in extrapolating the results of the levels of compliance with the quality criteria of this study to other services. However, regarding the effectiveness of the quality improvement cycle method, consistent statistical significance has proven to be a very promising, useful and effective approach for improving the image quality problem of general radiology exams, which will certainly bring benefits to other departments. ■

KEY POINTS

- ✓ The implementation of quality management programme is defined as "the set of structural elements and activities specific purpose is the continuous quality improvement"

- ✓ Strategic actions of a radiology department must ensure processes that correspond to the patient needs performed according to the best available scientific evidence

- ✓ In this study, the minimum relative improvement was 19% for the quality sub-criteria "Automatic exposure control" and "Ionisation chambers", and maximum for the sub-criteria "Radiographic markers/indicators" and "mAs" with 88% and 100%, respectively

- ✓ Absolute frequency of quality failures decreased from 174 (baseline) to 75 (revaluation)

- ✓ The internal quality assessment cycle has been useful and effective as a routine tool for continuous quality improvement of the healthcare process

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Guiding paediatric vascular access

NICE guidelines for ultrasound-guided placement of central venous lines in adults and children were first issued in the UK in October 2002. Dr James Bennett, Consultant Anaesthetist at Birmingham Children's Hospital, discusses how the debate has since moved on from whether ultrasound should be used for vascular access, to what other information and safety assurances it can provide, especially in paediatrics.

The transplant unit at Birmingham Children's Hospital – now part of Birmingham Women's and Children's NHS Foundation Trust – carries out around 35 liver and 12 kidney transplants a year, plus a smaller number of intestinal transplants, one of only two centres in the UK to perform this procedure. Children with liver disease are an especially challenging group when it comes to vascular access and those with bowel conditions particularly so; many have lost a significant part of their intestine and have been fed intravenously with parenteral nutrition, they may have lost a number of central veins, either as a consequence of the insertion technique previously used, or simply from the central venous catheters being in place for an extended period of time.

Over the last 15 years, point-of-care (POC) ultrasound has become an essential tool to quickly and safely aid anaesthetists, as well as the array of professionals from different clinical backgrounds who are now regularly inserting lines. However, for the more specialised area of paediatrics, and specifically for long-term venous access, for example Hickman lines in children with cancer, formalised training programmes are something of a challenge. For instance, while there is currently a module for central venous access in the syllabus for anaesthetists in training, there is little addressing long-term vascular access. The safety of central venous access is a matter of concern for the Association of Anaesthetists and last year it produced a document[1] providing guidance for vascular access.

In the meantime, at the Birmingham Children's Hospital, POC ultrasound guidance is now always used for central venous catheter insertion, and increasingly for arterial lines and difficult peripheral venous access. Ultrasound guidance is also establishing a valuable role in regional anaesthesia, for example TAP (transverse abdominis plane) blocks to improve analgesia following surgery in children.

Ultrasound guidance is the tool of choice particularly for the vascular access team, whose practice includes many challenging cases. At present, there are three portable systems used in the department which, while not the newest instruments on the market, provide the imaging quality and reliability that is required. It is also useful that they are small and mobile so can be moved easily, and manoeuvred into place around the many pieces of equipment that typically populate operating theatres.

In reality, most vascular insertions are remarkably easy using real-time ultrasound guidance; indeed accessing the vein is rarely a time-limiting factor, unless it's a particularly difficult case. The key advantage of course is safety; allowing quick identification of a suitable vessel and then guiding the cannulating needle into it, while avoiding other structures. Consequently most of these procedures are performed first pass without complication. It becomes a purely technical exercise, 'it's just a needle into a vein, and it's as easy as that'. The more advanced skills are saved up for the difficult cases when POC ultrasound really comes into its own. Ultrasound can demonstrate blocked or narrow veins, as well as imaging collateral and aberrant vessels. It often saves time because you can clearly image a blocked vein and choose a different access site. The use of Doppler ultrasound also allows assessment of flow within the vessels.

POC ultrasound does more for vascular access than just guiding a needle into a vein; you quickly gain the information about the vascular anatomy necessary to safely place a line. ■

[1.] Safe Vascular Access 2016, published by the Association of Anaesthetists of Great Britain & Ireland, **www.aagbi.org**.

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Birmingham Children's Hospital

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Update on medical student education

One of the main projects of EUROSON School is the introduction of Ultrasound in medical student education as it could be beneficial for many reasons.

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In the last year, EFSUMB Education and Professional Standards Committee (EPSC) along with the Publication committee cooperated on several educational and research projects and the organisation of several Euroson schools, mainly on CEUS and US-elastography and endorsed courses,

However, one of the main projects is the introduction of Ultrasound in medical student education. The EFSUMB position on medical student education using ultrasound was presented at Ljubliana, Euroson 2017 Meeting.

Education for students is traditionally based on training methods such as presentations, courses and workshops, the new technologies such as ultrasound equipment and web-based information have educational applications. Ultrasound is recognised worldwide as a powerful tool in the anatomic and pathologic evaluation of different organs, every day even more accessible, thanks to the availability of new ultrasound scanners, which are portable and miniaturised, with lower costs and greater effectiveness. However, throughout Europe, there is differentiation in competency levels (basic, advanced and teacher), which should be defined based on modules throughout Europe.

Reviewing literature, several papers coming from the United States, suggest that US can be effective for educational purposes. Therefore, as reported in a previous newsletter, and in previous ECR and at the present Euroson, EFSUMB decided to focus on student education in order to promote a standardised introduction in the US teaching program at the beginning of student training.

After reviewing the literature and the current experience (Hoppmann et al. 2011; Fodor et al. 2012; Hoppmann et al. 2011; Bahner et al. 2014) and preparing educational material, such as the EFSUMB Course Book for students and website material, EFSUMB published a position paper in two journals, Ultraschall [short version] and Ultrasound International Open [long version] (Cantisani et al. 2016).

Additionally, a new Student Committee was established in 2016 and a Task Force Group prepared a survey which was sent to many European medical school deans. This survey is now available on the EFSUMB website and was sent to all EFSUMB National Societies and mailing list members for completion (**https://de.surveymonkey.com/r/897RC8X**). Only 56 responses from 14 countries have been received and were evaluated.

From the initial responses we learned that implementing US into the medical school curriculum has been considered beneficial for the following reasons:

- Ultrasound knowledge is useful for all physicians
- It is useful to learn for later clinical practice
- It may help students learn anatomy.

However, emerging barriers for a better standardised US curriculum in medical schools were: Lack of time (in the curriculum); problems in equipment funding and lack of faculty workforce funding. Therefore, the three main challenges are: ▪ US EQUIPMENT (need for investment support from US producers?) "each student should have a US machine in the pocket"; ▪ SIMULATORS, simple, easy to manipulate, realistic, but expensive and not widely available; ▪ TEACHERS specialised in medical education and US practitioners in different clinical specialties currently are insufficient to teach US in an easy way, to explain artifacts and how to avoid them and to explain the limits of the procedure.

More recently first results from experiences in University of Vienna and Gdansk, Bergen, and Oslo have been received. We have collected all Medical School pilot studies results and suggestions and we are preparing proposals for a European ultrasound recommended curriculum platform which will be published in the near future.

In conclusion, currently, US education of medical students is mostly covered by radiology; however, in many medical schools, other departments, (anatomy, internal medicine obstetrics and gynaecology urology, etc.) are probably increasingly sharing the load to achieve this educational goal, but not yet in sufficient student education departments.

More teachers and hands-on training is the goal. Deans, medical education departments, other academics, and students are aware of the need to implement practical US education into the curriculum since they consider

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ultrasound as a very good educational tool for medical students. Teachers should be qualified experts to help students to identify the relevant data from the large amounts of information in the US image. Medical School pilot studies results will help to promote proposals for a European curriculum platform. ■

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A step forward for breast radiologists

Breast cancer screening and the breast imagers of the future

The future of breast examinations is changing. More and more screening methods are being invented as well as an influx of young radiologists hoping to make a difference. Members of EUSOBI tell us how.

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Breast cancer is the most common female cancer and the 2nd leading cause of female cancer deaths worldwide with its incidence increasing. According to the Office for National Statistics and the Public Health England in 2016, 100% of patients diagnosed with breast cancer at stage I survived the disease for at least one year compared to only 63% of patients diagnosed at stage IV. Furthermore, breast cancer mortality is highest among women who are not screened regularly and consequently present with advanced cancers. This highlights the necessity for early diagnosis to improve survival outcomes of breast cancer patients.

The overarching goal is to detect breast cancer as early as possible. To date there are several breast imaging tools available including digital and contrast-enhanced mammography and digital breast tomosynthesis (DBT), breast ultrasound (US) and magnetic resonance imaging (MRI). Each of these techniques has certain advantages but also limitations.

Numerous randomised controlled trials have shown that screening with mammography enables early breast cancer detection, reduces breast cancer related mortality and thus has been implemented in many healthcare systems over the past three decades. Although mammography is the mainstay for screening, its sensitivity is limited and it is particularly less accurate in a sub-group of women with dense breasts. Supplemental imaging with other modalities such as DBT, US and MRI may lead to the detection of breast cancers that are not visible on mammography. The combined use of mammography (or DBT), US and MRI could be the most sensitive approach to detect all breast cancer early, but at the same time this approach increases unnecessary recalls of women without cancer and comes at very high healthcare costs. Therefore, in the near future it is expected that mammography alone will not remain the primary screening protocol for all women; other modalities will gain a place.

Currently, breast MRI is considered the most accurate imaging method, detecting cancers that are not (yet) visible on other available imaging modalities. Moreover, breast MRI primarily detects biologically more aggressive breast cancers earlier whereas mammography is more biased towards detecting more indolent cancers. MRI is however relatively expensive, has limited availability and it is not tolerated by all women.

Because breast cancer continues to be a major cause of cancer related deaths in women, the search for improved breast cancer screening methods continues. Per definition, a screening tool should be effective, feasible and affordable because resources are limited in terms of cost and availability of breast radiologists.

In order to balance the costs and benefits of screening, screening research is turning towards personalisation of screening practice with different modalities offered with respect to an individual woman's risk factors for developing breast cancer, such as family history, breast density and medical history. Moreover, in the era of precision medicine, screening tests should aim at identifying several hallmark capabilities that cancers acquire during their development [1, 2], in order to reduce the risk of overdiagnosis and overtreatment. In this context, MRI has proven to be a versatile and precise imaging technique that can simultaneously assess a multitude of functional cancer-related processes. Therefore, mounting evidence supports the idea of population based screening with breast MRI, but its accessibility is limited because of the high costs.

Abbreviated or ultrafast breast MRI approaches strongly reduce magnet time (down to 2 minutes), and produce fewer images that need to be interpreted, abridging radiologist reading time. Therefore this may provide a reasonable solution to offer breast MRI as a screening tool to more women for whom it is currently deemed too expensive.

Other new technology such as DBT (an advanced form of mammography which uses low-dose x-rays creating a 3-dimensional image of the breast) and Contrast Enhanced Spectral Mammography (CESM)

which combines the benefits of full digital mammography with intravenous contrast utilisation might also allow an improved screening performance. CESM has similar accuracy to MRI and might be better tolerated (REF). Recent studies have shown CESM to be more accurate than standard full-field mammography regardless of breast density, and it may prove to be a cost-effective alternative even though contrast application is still mandatory. A further factor that will rapidly change the role of the radiologist in screening is the further development of artificial intelligence. Machine learning approaches based on convolutional neural networks are currently already able to "read" mammograms with an accuracy similar to that of non-specialised radiologists and will likely still become better over time. Consequently, the role of the radiologist will certainly change with the incorporation of such techniques in clinical practice.

Those entering breast radiology today are therefore faced with a highly multimodal field that is ever-changing. Flexibility and eagerness are needed to define indications for the multitude of new imaging options. While initially more radiologists might be needed to ensure coverage of the screening population over all modalities, likely the coming of age of artificial intelligence will change the role of radiologists in breast cancer screening. Continuous redefinition of the role of the breast radiologist is therefore also needed. Unfortunately, for reasons including concern about malpractice litigation, job-related stress, and low reimbursement, the number of radiologists choosing breast imaging is declining, and it is already difficult to find sufficient people to make sure that existing screening programmes can continue.

To elicit aspects of breast imaging that may be particularly powerful in attracting both trainees and educators to this field, scientific organisations continuously work to establish technical and clinical practice standards, facilitate the exchange of new knowledge and serve as advocates for regulatory and legislative issues. In Europe, the European Society of Breast Imaging (EUSOBI) promotes high quality in breast imaging, creates medical and scientific standards and aims to reduce breast cancer mortality through exchange of knowledge and scientific research. EUSOBI offers guidelines for breast MRI, high-risk screening and DBT. EUSOBI has so far published two recommendation papers for women's information for MRI and mammography respectively and more are in the pipeline.

Looking ahead

In tune with young radiologists needs, and in order to increase the interest for breast imaging among residents and fellows, in 2015 a platform for breast radiologists and breast imaging researchers younger than 40 years was initiated. The EUSOBI Young Club (EYC) was created as a non-political and non-profit network of younger professionals with the common interest to support and spread the knowledge of breast imaging. It provides a highly accessible platform for enthusiastic young researchers, residents and radiologists and facilitates interaction with acknowledged experts in the field.

The EYC embraces the opportunities offered by social media, since these media platforms have drastically changed how people communicate and how organisations reach their consumers. Young professionals are therefore more easily engaged using these communication channels. Through the EYC, EUSOBI is now active on Facebook, Twitter and Slack to connect breast imagers, breast cancer patients and other physicians in the field of breast care. On our online channels, followers may expect updates on ongoing research highlighting exciting new breast cancer imaging tools, and updates on existing breast imaging standards. In 2018, at the EUSOBI Annual Scientific meeting which will be held in Athens (Greece), the EYC also organises an event specifically for young breast imagers focusing on internal job opportunities and specific challenges that young radiologists currently face. ■

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The positives and drawbacks of HTA in laboratory medicine

An overview on the role of Health Technology Assessment (HTA) in healthcare

Prof. Giuseppe Lippi speaks with HealthManagement about his views on Health Technology Medicine in laboratory medicine and how it's improving the quality of care.

What do you think accredited scientific organisations can do to lend credibility to/increase confidence in HTAs?

The use of LEAN and HTA management is still largely insufficient in laboratory medicine compared to other medical fields. There are probably many issues that have contributed to such a poor diffusion, including lack of knowledge about the existence of these relatively innovative tools, the ongoing reorganisation of laboratory services driven by scale economy rather than by analytical efficiency and clinical efficacy, the lack of validated regulation for establishing an HTA process, as well as the strong - typically human - resistance against changes. The role of accredited scientific organisations is pivotal for increasing confidence in HTA, by disseminating the knowledge and demonstrating that HTA may be beneficial not only for sustaining laboratory economy, but also for improving laboratory organisation, clinical outcomes and patient safety.

Can HTA take the place of hands-on 'human' examination into lab processes?

Of course not. The role of HTA is to help in deciding whether a clinical test is generally cost-effective, but is not aimed to replace human examination of lab processes. To put it simply, what may work in a certain scenario, is not necessarily suitable for another. Esoteric testing and "-omics" techniques are paradigmatic examples. Due to ongoing restriction of healthcare funding, specialised diagnostic testing is becoming unsustainable in the single laboratory, but may find its most suitable place within a network of clinical laboratories, where the single facilities can specialise in one technology or medical field. This can also be seen as "scale economy", but should be driven by laboratory professionals and not by policymakers or hospital administrators.

What do you think is necessary to make clinicians comfortable with HTAs for lab processes?

The clinical-laboratory interface is often a critical issue in laboratory medicine. Many clinicians find it difficult to understand that cost-containment policies are creating considerable barriers to innovation or, occasionally, to maintaining conventional diagnostic panels unaltered. Communication between laboratory professionals and clinicians needs to be improved and, especially, clinicians should consider that laboratory diagnostics do not come free. The most reliable solution is to further promote appropriateness, since what can be saved by reducing inappropriate or unjustified tests, can then be reinvested for introducing innovative technologies.

> **"THE ROLE OF HTA IS TO HELP IN DECIDING WHETHER A CLINICAL TEST IS GENERALLY COST-EFFECTIVE, BUT IS NOT AIMED TO REPLACE HUMAN EXAMINATION OF LAB PROCESSES"**

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What are some of the challenges when it comes to sustainable diagnostic tests and how can they be overcome?

The sustainability of diagnostic testing is challenged by many issues. These include

1. The still excessively high burden of inappropriateness;
2. The increasing role of personalised (laboratory) medicine, which requires using highly specific tests for dissecting genotypes, phenotypes and predicting individual therapeutic response;
3. The evolving disease epidemiology, which is also recently sustained by increasing immigration of populations from third-world to industrialised countries;
4. The increasing need of safe and appropriate care perceived by the patients, worldwide;

THREATS

Inappropriateness
Personalised (laboratory) medicine
Evolving disease epidemiology
Increasing need of safe and appropriate care
Longitudinal cuts in healthcare funding

Sustainability

**IN VITRO
DIAGNOSTIC TESTING**

Health Technology Assessment

Elimination of obsolete or redundant tests
Promotion of innovative and cost-effective testing

Improved quality of care
Decreased overall healthcare costs

5. Longitudinal cuts in healthcare funding, which do not specifically target cost-ineffective activities. The solution of all these problems entails a cutting-edge approach, based on renewed partnership among healthcare professionals and/or scientific organisations, citizens representatives, health and social-sanitary representatives, commercial and non-profit partners and university delegates.

Can you please elaborate on some of the major drawbacks?

The major drawbacks of HTA include the still scarce popularity (at least in laboratory medicine), the potential conflict with personalised (laboratory) medicine (i.e. the "one test fits all" paradigm is no longer valid, so that the outcome of HTA may not be generalisable in all patients), the lack of universal agreement about rules and regulations, as well as the potential conflict of interest of members of HTA teams.

How can we use HTA for sustainability of the healthcare system?

The outcome of many HTA analyses will be indeed valuable for the sustainability of the healthcare system, provided that the right approach will then be used in the right context. In general, HTA may help identifying obsolete or redundant testing, but may also promote the introduction of innovative tests, which can ultimately help decrease the overall healthcare expenditure. Predicting the development of certain pathologies within an appropriate time-frame and the therapeutic response will both generate a net benefit for the entire

healthcare industry, since the incremental costs due to introduction of new tests can be completely counterbalanced by decreasing the risk of disease development and by using the most appropriate therapeutic weapons in the single patient. This would finally allow a much better allocation of human and economic resources.

How do you minimise the use of technologies that are ineffective or harmful?

This is precisely where HTA finds its main strength. The expert HTA panels are responsible for reviewing applications and periodically updating diagnostics lists, to account for improvements in technology and shifting disease epidemiology. In brief, the main goal of HTA is the careful evaluation of a medical or diagnostic technology for evidence of safety, efficacy, cost-effectiveness, but also considering the potential ethical, legal and social implications. The demonstration of no cost-effectiveness of a given test of technology may also support laboratory professionals to eliminate tests, by presenting objective data to clinicians and to all the other stakeholders (i.e., patients and relatives).

What is the current status of the HTA Review and its recommendations?

Several lines of evidence now demonstrate that HTA should be regarded as one element providing multiple values to innovation in laboratory medicine. Nevertheless, HTA analyses of diagnostics tests remain quite infrequent in the international literature. There is a compelling need to fill this gap and scientific societies and organisations should be proactive or promoting (and participating to) HTA in laboratory medicine. ■

Bright
Instruments

Bright Instruments to exhibit at popular MEDICA trade fair

Bright Instruments are due to be exhibiting at the popular trade fair MEDICA in Düsseldorf, Germany between the 13-16 November 2017.

The company, who have been operating since 1937, are keen to catch up with their global distribution partners, as well as meeting and discussing with end users the various benefits and features of the brand's instruments.

Furthermore, it is hoped that new distribution partnerships can be formed and cemented, in areas of the world Bright Instruments do not already have a present partner.

Digital Marketing Executive Matthew Trussell said: *"Essentially a key part of my role is connecting our company with distributors and end users around the world, which includes educating people about the unique and exciting benefits we possess. Manufacturing in the UK, building bespoke machines and providing comprehensive aftersales packages are all things we're very proud to be able to do. It became pretty apparent to me when I began working here that it's something very special. There's so much passion and expertise in-house and I genuinely believe it transpires in these long-lasting,* quality instruments."

If anyone is attending the show and would like to meet Bright Instruments, you can visit them in **Hall 3a, Stand 3AD02-7.**

Bright Instruments continues to grow its worldwide distribution network

The company currently enjoys a network of over 30 distributors around the globe, but aren't keen to rest on their laurels just yet.

"We're really excited to continue this momentum and ensure it's easier and more efficient for our end-users to receive instruments as and when they require them. Anywhere we spot further opportunity, we are happy to enter the necessary discussions and forge efficient and lengthy professional partnerships" Manager Andrea Taylor stated.

"Furthermore, if any experienced suppliers out there have a desire to enter discussions with us, we're always approachable and open to any opportunities of mutual benefit. Ultimately it's about delivering first class equipment to improve medical sectioning."

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New toolkit helps nurses use genomics for patient care

Resource available for all levels of genomics competency

The new 'Method for Introducing a New Competency: Genomics' (MINC) toolkit is helping nurse leaders fine tune and improve patient care.

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Nurses and other health professionals looking to integrate genomics into patient care now have access to an online toolkit with multiple resources as part of a new website launched by the National Human Genome Research Institute (NHGRI).

Developed with input from clinical educators and administrators, A Method for Introducing a New Competency: Genomics (MINC) website provides resources for nursing leaders at all levels of genomics competency, ranging from basic knowledge about genomics to its practical impact on healthcare systems and policies.

The website addresses the need for healthcare professionals to stay abreast of the rapidly changing healthcare environment. Its resources can help practicing nurses care for patients undergoing genomic testing and treatments, build awareness in their communities, and understand how to prepare their workforce for emerging clinical applications.

Healthcare providers recognise that genomics is moving at a very rapid pace, but they are often unsure how to put genomics into practice. NHGRI believed that a "how-to-get-started" guide would be beneficial for not only nurses, but all healthcare providers. By building upon the successes of those who are already implementing genomics into practice, providers new to this area can "jump-start" their institution's resources and abilities to meet the needs of their patients in genomic and genetic testing.

How it works

The MINC toolkit provides successful interventions, including education resources for practitioners, letters to administrators, and ways to work past institutional hurdles that might otherwise be barriers to implementing genomics into practice.

In terms of the importance of training in this area, it is critical that nurses are knowledgeable in genomics, because they are often the first to receive information from patients suggesting that genomics may play a role in the identification, diagnosis and treatment of their disorder. In addition, because the response of individuals to certain drugs varies depending upon their genetic profile, awareness of pharmacogenomics by everyone on the healthcare team increases the potential to provide "precision care", the right medicine for the right person at the right time.

The toolkit is structured in a question and answer format, allowing users to tailor their interventions based on the resources that will work best for them in their unique clinical setting. A key feature of the toolkit is "Champion Stories". These video testimonials from health administrators and educators describe how they overcame barriers as they developed the necessary genomics knowledge to offer personalised care to their patients.

MINC background

The MINC website for nurses was developed with funding from the National Council of State Boards of Nursing (NCSBN), NHGRI, and the National Cancer Institute. Working through MAGNET hospitals, nurses and their colleagues worked together over a period of one year to develop resources to integrate genomics into practice at their individual institutions.

Programme participants (i.e. Educator and Administrator "Champions") suggested that NHGRI utilise their experiences and create a toolkit for others integrating genomics in their healthcare settings. The first step was to convene a small Advisory Panel from nurses, administrators, and others involved in the project, who then conceptualised and guided the development of the MINC toolkit. The many resources used by the teams were then compiled and curated into a free toolkit (www.genomicsintegration.net) for others to use.

Implementation of toolkit

The MINC toolkit offers several approaches depending on the interests and needs of the user. If a potential user is new to genomics, they can start exploring the toolkit by selecting question items on the left of the homepage. These questions highlight information for the nurse who may want to know more about why

genomics is important to the practice of nurses, how to integrate genomics into patient care, strategies that have been helpful to others, suggestions for ways to overcome challenges, where to find help, and more.

If the user has a foundational understanding of genomics and its uses in patient care, but needs additional guidance, users can find additional audience-specific resources at the tabs labelled "For Administrators" or "For Educators", such as workforce education or business plans. Champions provided sample action plans, business pro forma examples, a slide set to highlight the process, and a list of consultants willing to be contacted for additional assistance.

The MINC toolkit also offers a tab to allow users quick access to all available resources at the "browse resources" link. The user can browse the resource titles to see interventions offered, select examples which could work well in their settings, tailor them to their audiences, and design a programme targeted to work well in their institutions. Many of these resources were created specifically by the Champions for making their workforce aware of the value of genomics for patient care. The MINC toolkit went live in July 2017. Many

explained they were excited to share the toolkit with their professional healthcare colleagues, and expected to use the resources in the toolkit at their institutions. We encourage toolkit users to provide us feedback about the site, so that it can be maintained and improved. The form can be viewed at by clicking the "Give Feedback" button on the right side of the site at www.genomicsintegration.net. ∎

KEY POINTS

- ✓ The MINC toolkit went live in July 2017 and helps health professionals integrate genomics into patient care

- ✓ Use of the toolkit can be tailored to needs and interests of the user

- ✓ The website addresses the need to stay informed about the rapidly changing healthcare environment

- ✓ Feedback is encouraged from toolkit users to improve and maintain site

How Human-Centred Design improves patient experience

How salauno has used an interdisciplinary team with a Human-Centred Design approach with impressive patient results.

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Salauno was founded in 2011 to eliminate needless blindness in Mexico where it is the second biggest cause of disability. Salauno's model is low-cost, high-quality and high-volume which has allowed it to attend to 200,000 low-income patients and carry out 29,000 surgeries that have restored eyesight.

In 2016, salauno decided to focus on improving the patient experience. We had been measuring patient satisfaction with the Net Promoter Score for over a year so we had solid data and knew we were doing well but wanted to take the patient experience to the next level. We knew we wanted to create a 'wow factor' for each patient, but had never defined what that meant. We turned to Human-Centred Design (HCD), a creative approach to problem solving, to take on this project. I would like to share some of our lessons learned.

We found that the key to successfully redesigning the patient experience is to adopt an HCD mindset which means:

Accept that you do not know

Although many of us have been working with our patients for years and feel like we know them inside and out, it is key to embrace the idea that because we have never asked these questions or been open to hearing everything they think and feel, we are going to learn from our patients.

Develop empathy

Since we will be hearing new perspectives, it is likely that we will discover surprising points of view with which we do not necessarily agree. We do not need to agree with our patients; we just need to understand them, in order to then design for and with them. At salauno this meant that when patients told us they found the plain old plastic chairs much more comfortable than our pretty shiny metallic chairs, we had to remember that we were designing for them, not us.

Question everything

If we want to truly innovate in the patient experience, we must question the status quo. Just because things are done a certain way doesn't mean they should continue to be done that way. In fact, when you ask why something is done a certain way and the response is that it's always been done this way, you've probably found something ripe for change.

Try new things

If we want to truly redesign the patient experience, we must be willing to try new things. If not, it's a waste to go through this entire process and would be more productive to go with the first idea that comes up in a meeting. The HCD process will lead us to what may seem like improbable or crazy ideas and we must be willing to test and try things before simply discarding them.

Learn from failure

If we follow the HCD methodology properly, we are guaranteed to fail…at some of our ideas. This is normal and as long as we make sure to learn from those failures, they will be a productive part of the process. At salauno this meant that our brilliant idea of using QR codes to educate patients didn't work because very few people knew how to scan a QR code and even fewer had a QR reader on their phone.

Iterate, iterate, iterate

I guarantee that no idea will survive unchanged. Ideas will fail or morph along the way. We must adapt and move quickly to get to the right iteration of an idea. At salauno this meant that we started out with an informative multi-page booklet that patients barely looked at after receiving it upon their arrival. The booklet turned into one single sheet distributed per consultation step that patients spent two more seconds looking at before folding and putting away. The single page info sheets finally morphed into laminated sheets handed out at each step that patients actually did read. We would never have guessed that laminating would be the key to making this idea work.

Interdisciplinary team

With this mindset established, you need to assemble an interdisciplinary team. You can't get the kind of innovation you need if you gather the usual suspects (top management) to define solutions. At salauno, this meant putting together a team that included a doctor,

The HCD approach involved brainstorming ideas with loads of post-its full of suggestions.

> **JUST BECAUSE THINGS ARE DONE A CERTAIN WAY DOESN'T MEAN THEY SHOULD CONTINUE TO BE DONE THAT WAY**

optometrist, clinic assistant, clinic managers and quality and process staff.

With the team in place, you can structure your project according to the 3 main phases of HCD:

- **Listen:** In this phase we listen to the patient's voice. This involves conducting ethnographic interviews (open ended questions to understand patients feelings and experiences without guiding them to the "right" answer), analysing existing data/patient input, and conducting immersions. While some feel there is no need for this phase ("I already know my patients") and some feel they could spend months on this phase ("we haven't spoken to every patient type yet"), the methodology encourages us to assume that we don't know and yet also not attempt to do a statistically significant study. At salauno, in addition to interviewing patients, we went to analogous contexts like hotel lobbies and children's hospitals and did shadowing and empathy exercises to better understand our patients' experiences. We closed this phase with a step-by-step map of the patient experience with problem areas identified.

- **Create:** In this phase we create solutions to the problems we identified. This involves many brainstorming sessions (full of post-its!). The keys to success are to focus on quantity, not quality of ideas (at first), to not pre-filter ideas and to allow for the most audacious ideas to come out first (if you don't allow them to come out in this phase, they never will) and to look for inspiration in unexpected places (if we only look to other healthcare providers, we will only make incremental improvements, but if we look elsewhere we can start to truly innovate). At salauno, we were inspired by how car dealerships celebrate closed sales and created the idea of ringing a bell whenever we had a recovered patient released post surgery so that staff could gather to applaud and congratulate the patient (thus also fostering confidence in other patients). We closed the phase with a list of top ideas that we wanted to test.

- **Test:** In this phase we test the ideas we have developed. The key to success in this phase is to get physical. In order to truly test an idea, we cannot just talk to patients about it - we must put it in front of them. This is where prototypes come in. We can prototype with mockups, drawings, legos, simulations or anything else that enables patients to really experience our idea. This is key to getting real and honest feedback so we can iterate as needed until the idea passes the patient test. It's much better for an idea to fail or require changes while being developed as opposed to once it's fully launched across your health system. At salauno, we had the idea of having physicians fill out a personalised take-home visit summary for patients. During testing, the sheet was consistently left blank so we realised that, though it was a good idea, it was too manual and time consuming for our current operation. We closed the phase with a final list of concepts validated by tests (and some that died in the process).

Innovate: practices at a car dealership gave salauno a good idea on how to celebrate successful surgery
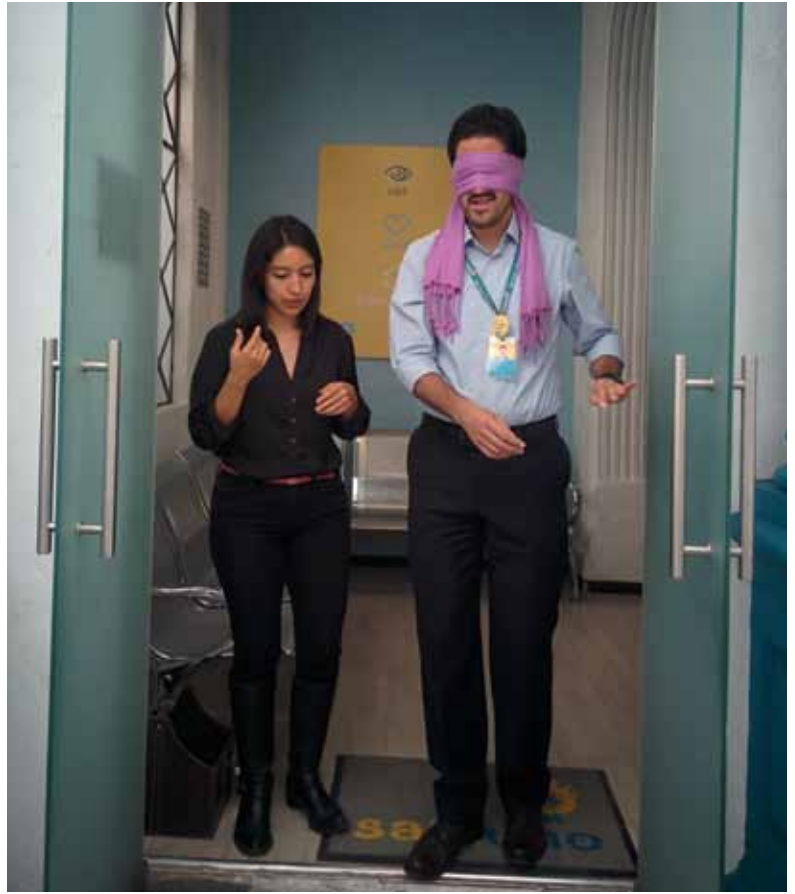
Implementing HCD requires hands-on practical testing to understand the patient experience

Implementation

Once this HCD process is completed (which at salauno took two months), we must focus on implementation and standardisation so that the ideas we designed really make it all the way to the patient in a consistent way. This involves creating staff awareness, training, manuals, audits and other mechanisms in daily operations to make the leap from theory to practice.

To apply HCD in your setting, I recommend the IDEO Design Kit (designkit.org/resources/1), a useful free online HCD resource. Of course, I'm also happy to connect to discuss your particular project. ∎

Daphne S. Leger has a background in international development and an MBA from Harvard Business School. In 2015, she joined salauno, a social enterprise in the healthcare sector, as Director of Continuous Improvement. In this role, Daphne creates a continuous improvement culture, optimises operations using Lean, Six Sigma and Kaizen methods and drives innovation in the patient and staff experience.

KEY POINTS

- ✓ Human-Centred Design (HCD) is a creative approach to problem solving

- ✓ Assemble an interdisciplinary team rather than follow the status quo style of project implementation and management

- ✓ Accept that you don't know as much as you think

- ✓ You do not need to agree with patients; you just need to understand them

- ✓ Just because something has always been done a certain way doesn't mean it should remain that way

- ✓ Accept some ideas will fail and learn from this

- ✓ Be creative and allow for expression of what may seem to be outlandish ideas – they may be the best ones

- ✓ Test ideas with patients in a practical manner for authentic results

- ✓ HCD embraces an iterative process in the development of a new practice

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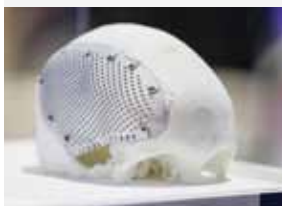
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Calling China's champions for global health

How the economic giant is advancing healthcare across the globe

The World Health Organization (WHO) argues China's private sector ecosystem capabilities have a great deal to offer global healthcare innovation.

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Earlier this year at the World Economic Forum, President Xi Jinping delivered a hearty defence of globalisation. To people following world affairs for the last few decades this should not have come as a surprise. It is well known that China is the world's second-largest economy and a global force in manufacturing and trade. What is less well known is that China has taken on increasingly critical roles in global health and development, which it views as necessary to sustain and accelerate global economic growth.

In June this year, as leaders converged on Dalian, Northeast China's Liaoning province, for the World Economic Forum's Annual Meeting of the New Champions, it became clear that globalism needs another kind of Chinese champion – its private sector innovators.

China is in the midst of a technology revolution. Home to more electric cars than anywhere in the world, its enterprises are driven by the energy of its enormous market and a fierce competition to innovate products. China started the shared-bike revolution that is transforming urban transportation in cities. WeChat Wallet has been a boon for the e-pay market, linking services in every imaginable sector. This is good news for not only the Chinese economy, but also global health. Innovation that responds to specific consumer/patient needs is precisely what is needed to help save millions of lives.

China's contribution to global health and development is focused on the health sector. For decades Chinese physicians and medical specialists have been working in developing countries, most recently in the World Health Organization-certified Emergency Medical Teams formed to respond to health emergencies. It has helped finance and build large-scale infrastructure projects – roads, hospitals and healthcare centres – and it is sharing its experiences with other countries in building a strong health surveillance and monitoring system.

Recently, China's private sector has ramped up its participation. Four years ago, China entered the global vaccine market with a Japanese encephalitis vaccine, the country's first to be pre-qualified by the WHO. Other Chinese vaccines are in the pipeline to be pre-qualified

by WHO, including an inactivated polio vaccine — essential in the endgame strategy to eradicate polio and for which there is a global shortage.

In January, President Xi met with the WHO director general in Geneva to sign an agreement to radically improve access to healthcare beyond China through the Belt and Road Initiative.

One of the biggest challenges is how to improve the delivery of healthcare interventions, such as vaccines, by connecting high-impact innovations with the countries that need them the most. Organisations like WHO, UNICEF and Gavi, the Vaccine Alliance, have already made huge progress in improving access to health services and reached a stage where 81% of infants in developing countries are receiving routine immunisation. This has helped halve childhood mortality. Yet 1.5 million children below five years of age still die of highly preventable diseases every year, because 19 million children lack access to vaccines.

❝INNOVATION THAT RESPONDS TO SPECIFIC CONSUMER/PATIENT NEEDS IS PRECISELY WHAT IS NEEDED TO HELP SAVE MILLIONS OF LIVES ❞

Addressing this inequity means finding novel ways to bring vaccines to hard-to-reach children and filling the gaps within health systems, supply, data and infrastructure. To do this, we need innovative solutions, such as drones. The majority of civilian drones in the world are developed and produced in China, making China the leader in this technology. While primarily aimed at the consumer market, there is huge scope for this technology to be used for more humanitarian purposes.

In Rwanda, for example, a nationwide autonomous drone-based delivery system was launched last year, which delivers emergency supplies of blood from a central distribution centre in the capital, Kigali, to rural districts. Now, a mother haemorrhaging during childbirth can have the life-saving blood within 20 minutes, instead of waiting hours for a motorcycle delivery. Developed as part of a partnership between U.S. drone company Zipline, the Rwandan government, UPS and Gavi, the plan is to eventually extend this to deliver vaccines, too.

Drones are just one example. Another is Aucma, a Chinese innovator that developed the Arktek portable passive cold storage device, which can maintain temperatures as low as -80 Celsius without any power and which proved essential in transporting the Ebola vaccine during the outbreak of the disease in West Africa.

Statistics	
Total population (2015)	400,000,000
Gross national income per capita (PPP international $, 2013)	11
Life expectancy at birth m/f (years, 2015)	75/78
Probability of dying under five (per 1, 000 live births, 0)	not available
Probability of dying between 15 and 60 years m/f (per 1, 000 population, 2015)	98/71
Total expenditure on health per capita (Intl $, 2014)	731
Total expenditure on health as % of GDP (2014)	5.5

Latest data available from the Global Health Observatory
Republished with permission of the WHO.

Given the diverse and vibrant nature of China's private sector ecosystem, it is likely many more potential solutions are waiting to be found. From data systems to mobile phone-based technologies, the opportunity is to turn China's innovation champions into global health champions. And that is a global trade system we should all support. ∎

KEY POINTS

🔑

✓ China is taking on increasingly critical roles in global health and development

✓ Innovation that responds to specific consumer/patient needs can save millions of lives

✓ Physicians and medical specialists from China have been working in developing countries for decades

✓ A critical challenge is improvement of healthcare intervention delivery such as vaccines

✓ Organisations like WHO, UNICEF and Gavi, the Vaccine Alliance have greatly improved vaccine access

✓ China-produced drones are improving delivery of emergency supplies

✓ China's private sector can offer healthcare innovation to global economy

"If opportunity doesn`t knock, build a door" –
Milton Berle

ANGELINA HAKIM

MEDICAL DEVICE, QUALITY MANAGEMENT EXPERT AND CEO/ FOUNDER - QUNIQUE LTD, SWITZERLAND

What is your top management tip?
Regulatory challenges are real. Take them seriously and allow your company to embrace the changes required to be ready to face these challenges.

PAUL SIDHU

PROFESSOR OF IMAGING SCIENCES AND CONSULTANT RADIOLOGIST - KING'S COLLEGE LONDON, UK, PRESIDENT ELECT, EUROPEAN FEDERATION OF SOCIETIES FOR ULTRASOUND IN MEDICINE AND BIOLOGY (EFSUMB)

What is your top management tip?
Learn to delegate appropriately, otherwise you just fall over.

What would you single out as a career highlight?
There are many occasions that I have been humbled by an event, but acknowledgment by being awarded honorary membership of ultrasound societies across the world, motivates me further. This demonstrates to me that what I am doing is being recognised, and I am very grateful to for this.

When you do not get what you want, perhaps you did not take the right path to success.

ARNAUD HANSSKE

FOUNDER AND CIO OF THE KASHMIR LAB, FRANCE

What would you single out as a career highlight?
The creation of the Kashmir Laboratory.

"Success is not final. Failure is not fatal. It is the courage to continue that counts" -
Winston Churchill

RAFAEL BEYAR

CHIEF EXECUTIVE OFFICER & DIRECTOR GENERAL RAMBAM HEALTH CARE CAMPUS WOMEN'S DIVISION/DR PHILLIP AND SARA GOTLIEB CHAIR PROFESSOR OF MEDICINE AND BIOMEDICAL ENGINEERING, TECHNION-IIT, ISRAEL

What is your top management tip?
My top management advice for managers and directors of hospitals is to be able to look at the eyes of our patients. The hospital director should directly communicate with the patients and understand their needs. As a clinician, a cardiologist, I do that on a regular basis.

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