



Cash Cow

- EDITORIAL, *C. MAROLT*
- MEASURING HEALTHCARE OUTCOMES TO DELIVER VALUE AND LOWER COSTS, *R. S. KAPLAN & M. E. PORTER*
- REVENUE CYCLE MANAGEMENT, *B. STEWART*
- USE PATIENT SAFETY TO IMPROVE YOUR BOTTOM LINE, *D. B. MAYER*
- DELIVERING HIGH-VALUE IMAGING: A PARADIGM SHIFT FROM EFFICIENCY TO EFFECTIVENESS, *Y. ANZAI*
- PUBLIC-PRIVATE PARTNERSHIPS: A WIN-WIN FOR DANISH HEALTHCARE AND FOR THE INDUSTRY, *H. E. HENRIKSEN*
- DISRUPTION IS COMING TO HEALTHCARE, *R. PEARL*
- HEALTHCARE DATA: CREATING A LEARNING HEALTHCARE ECOSYSTEM, *E. STUPKA*
- DIGITAL TRANSFORMATION FOR MORE EFFECTIVE HEALTHCARE: INSPIRING VBHC INITIATIVES, *F.V. EENENNAAM ET. AL.*

NEW HEALTHMANAGEMENT.ORG EXEC EDITOR-IN-CHIEF, *A. LOURENÇO*

LEADING BREAST RADIOLOGIST WINS 2019 RSNA ACCOLADE, *F. GILBERT*

THE FUTURE OF CARDIOVASCULAR MEDICINE – TECHNOLOGY, GENDER BIAS AND TREATMENT STRATEGIES, *M. A. MAMAS*

2020: ANOTHER YEAR OF RADICAL CHANGE IN HEALTHCARE, *L. DONOSO-BACH ET AL.*

CREATING THE DREAM TEAM IN RADIOLOGY, *L. MARTÍ-BONMATÍ*

HOW TO INTEGRATE AI INTO RADIOLOGY WORKFLOW, *B. V. GINNEKEN*

BRIDGING THE RADIOLOGIST STAFFING GAP WITH NEW TRAINING INITIATIVE, *C. RUBIN*

CULTIVATING INNOVATION CULTURES IN HEALTHCARE, *D. MICHAELIDES*

THE IMPORTANCE OF BODY LANGUAGE, *A. NOOTEBOOM*

MEASURING THE NATION'S HEALTH, *H. DUNSFORD & C. NORRIS*

RESILIENCE: THE AIRBAG FOR NURSES AND OTHER HEALTHCARE PROFESSIONS, *I. MEYENBURG-ALTWARG*

MEDICAL IMAGE EXCHANGE IN THE CLOUD: A MORE EFFICIENT WAY, *M. CABRER*

THE ROLE OF EIT HEALTH IN TRAINING THE EUROPEAN FUTURE WORKFORCE, *A. DUCHER & U. MÜHLE*

THE ABC OF PATIENT ENGAGEMENT: TIME TO BREATHE NEW LIFE INTO OLD STORIES, *E. SUTCLIFFE*



9 771377 762006



VISIT US AT RSNA 2019: #8313 - NORTH HALL LEVEL 3, #10710 AI SHOWCASE

END-TO-END AI

iNtuition, EnvoyAI, and Northstar Technologies Combine to Form World's First End-to-End AI Workflow



EXPERIENCE NEXT-GENERATION ADVANCED VISUALIZATION

- Over 650 enhancements in iNtuition.
- Gold Standard Cardiac & Vascular Functionality
- Comprehensive Packaging
- Open Platform & Deep Integrations

EXPERIENCE THE ENVOYAI PLATFORM - FEATURING THE NORTHSTAR AI RESULTS EXPLORER

- SIMPLE ACCESS - One contract, one implementation, and one point of access for many of the world's best AI algorithms.
- MARKET MOMENTUM - Recognized as a best new software and best new vendor for radiology in 2018.
- BEST-OF-BREED AI - Premium curated AI content with over 70 research use and FDA cleared algorithms from leading innovators.



Incredible Things Happen™

Tel : | INFO@TERARECON.COM | www.terarecon.com

Cash Cow

Is the healthcare bottom line en route to hitting rock bottom? Is the system bankrupt? Does the system still waste too much cash? Where is the real bottom line? Rising overheads, high staffing, supply and technology costs challenge current operating models. Are they outdated or are they becoming unsustainable? What could save the day? Adaptivity? Imagination? Innovation? Proactivity? Flexibility? Or all of them together?

In this issue, we look at some of the key factors influencing how healthcare can take control on both macro and micro levels to steer the course towards sustainability. With proponents of value-based healthcare, Robert Kaplan and Michael Porter, we focus on the steady drive towards value over volume. We also examine the benefits of Public-Private Partnerships, the making of imaging practices more cost-effective, revenue-cycle management, and the significant role data can play in improving clinical and financial outcomes.

The end of the year is the time when radiology holds the stage as the exciting and illustrious RSNA takes place in Chicago. In recognition of this year's 105th assembly, we have a special focus on imaging with an interview with Fiona Gilbert, RSNA 2019 honorary membership recipient. Additionally, we shine the spotlight on the

impact AI is having across radiology and how its power can be harnessed for the good of practitioners and patients. We evaluate the impact of artificial intelligence and Big Data in cardiology, and discuss how gender bias could be tackled.

As always, we have offered a smorgasbord of insights from management experts including a look at leading trends for 2020, the development of a winning team and the impact of body language.

Elsewhere, we look at innovation in training both healthcare practitioners and patients for a healthcare landscape that is fast becoming de-siloised, and a leading network that is leveraging digitalisation with great success.

We trust you will find valuable reading in our final journal of 2019 to fire you up with enthusiasm for the new decade that's just around the corner.

Let me encourage you to engage with us and to contribute to our great 2020 topics. Simply send me an email.

Thank You!



Christian Marolt

Executive Director
HealthManagement.org, Cyprus

cm@healthmanagement.org

[in@cmarolt](https://www.linkedin.com/company/cmarolt)

[@cmarolt](https://twitter.com/cmarolt)

HealthManagement.org

HEALTHMANAGEMENT.ORG EDITORIAL BOARD

Promoting Management and Leadership in Healthcare

IMAGING

EDITOR-IN-CHIEF

Prof. Lluís Donoso Bach

Hospital Clinic – University of Barcelona, Spain
ldb@healthmanagement.org

EDITORIAL BOARD MEMBERS

Prof. Stephen Baker

Rutgers New Jersey Medical School, USA

Prof. Hans Blickman

University of Rochester Medical Center, USA

Prof. Edward I. Bluth

Ochsner Healthcare, USA

Prof. Georg Bongartz

University of Basel, Switzerland

Prof. Frank Boudghene

Tenon Hospital, France

Prof. Davide Caramella

University of Pisa, Italy

Dr. Ai-Lee Chang

Guys and St Thomas NHS Foundation Trust, UK

Prof. Alberto Cuocolo

University of Naples Federico II, Italy

Prof. Johan de Mey

Free University of Brussels, Belgium

Prof. Nevra Elmas

Ege University, Turkey

Dr. Mansoor Fatehi

Medical Imaging Informatics Research Center, Iran

Prof. Guy Frija

Georges-Pompidou European Hospital, France

Assoc. Prof. Frederik L. Giesel

University Hospital Heidelberg, Germany

Prof. Wolfram Knapp

Hannover Medical School, Germany

Prof. David Koff

Hamilton Health Sciences; McMaster University, Canada

Prof. Elmar Kotter

University Hospital Freiburg, Germany

Prof. Heinz U. Lemke

International Foundation for Computer Assisted Radiology and Surgery (IFCARS); University of Leipzig, Germany

Prof. Lars Lönn

National Hospital, Denmark

Prof. Elisabeth Schouman-Claeys

APHP Medical Organisation Directorate; University of Paris 7, France

Prof. Valentin Sinitsyn

Federal Center of Medicine and Rehabilitation, Russia

Dr. Nicola H. Strickland

Imperial College Healthcare NHS Trust, UK

Prof. Henrik S. Thomsen

Copenhagen University Hospital; University of Copenhagen, Denmark

Prof. Vlastimil Valek

Masaryk University, Czech Republic

Prof. Berthold Wein

Group Practice, Aachen, Germany

HEALTHCARE IT

EDITOR-IN-CHIEF

Prof. Christian Lovis

University Hospitals of Geneva, Switzerland
cl@healthmanagement.org

EDITORIAL BOARD MEMBERS

João Bocas

Digital Salutem, UK

Miguel Cabrer

University Hospital Son Espases, University of the Balearic Islands, Palma, Spain

Richard Corbridge

Leeds Teaching Hospital NHS Trust, UK

Dr. Marc Cuggia

Pontchaillou Hospital, France

Prof. Georges de Moor

State University of Ghent, Belgium

Dr. Peter Gocke

Amedes Medizinische Dienstleistungen, Germany

Prof. Jacob Hofdijk

European Federation for Medical Informatics, The Netherlands

Prof. Werner Leodolter

University of Graz, Austria

Prof. Eric Lepage

Hôpitaux de Paris, France

Prof. Josep M. Picas

Adaptive HS, Spain

Prof. Eric Poiseau

IHE Europe, France

Prof. Karl Stroetmann

Empirica Communication & Technology Research, Germany

Ms. Diane Whitehouse

The Castlegate Consultancy, UK

Ing. Martin Zeman

CESNET, Czech Republic

CARDIOLOGY

EDITOR-IN-CHIEF

Prof. Tienush Rassaf

Essen University Hospital, Germany
tr@healthmanagement.org

EDITORIAL BOARD MEMBERS

Prof. Gunter Breithardt

University of Munster, Germany

Prof. Hugo Ector

University Hospital Leuven, Belgium

Prof. Michael Glikson

Shaare Zedek Medical Center, Israel

Priv.-Doz. Philipp Kahlert

Universitätsklinikum Essen, Germany

Prof. Peter Kearney

Cork University Hospital, Ireland

Prof. Alexandras Laucevicius

Vilnius University Hospital, Lithuania

Prof. Fausto J. Pinto

Lisbon University, Portugal

Prof. Piotr Ponikowski

Clinical Military Hospital, Poland

Prof. Silvia G. Priori

University of Pavia, Italy

Prof. Amiran Revishvili

Scientific Center for Cardiovascular Surgery, Russia

Prof. Massimo Santini

San Filippo Neri Hospital, Italy

Prof. Ernst R. Schwarz

Cedars Sinai Medical Center, USA

Prof. Dan Tzivoni

Israel Heart Society, Israel

Prof. Alex Vahanian

Bichat Hospital, France

INDUSTRY AMBASSADORS

Dan Conley, USA

Marc De Fré, Belgium

Prof. Okan Ekinci, USA

Prof. Mathias Goyen, UK

Dr. Rowland Illing, UK

Jurgen Jacobs, Belgium

Ljubisav Matejevic, Germany

Gregory Roumeliotis, USA

Dr. Jan Schillebeeckx, Belgium

Have your say. Engage!

The healthcare bottom line has long been en route to hitting rock bottom. Will new business models and financial disruption lead to a brighter, more sustainable future for healthcare? We welcome your views. As a leading print and digital publication on healthcare management and leadership, there are many ways to share your ideas and join our faculty of highly-esteemed writers. To contribute, contact us on edito@healthmanagement.org

GUEST AUTHORS

EXEC

EDITOR-IN-CHIEF

Alexandre Lourenço

Centro Hospitalar e Universitário de Coimbra, Portugal
al@healthmanagement.org

EDITORIAL BOARD MEMBERS

Dr. Gilbert Bejjani

CHIREC Hospital Group, Brussels, Belgium

Philippe Blua

Hospital Center of Troyes, France

Juraj Gemes

F.D. Roosevelt University Hospital, Slovakia

Prof. Sir Muir Gray

Better Value Healthcare, Oxford, UK

Sjaak Haakman

Reinaert Kliniek, The Netherlands

Marc Hastert

Federation of Luxembourg Hospitals, Luxembourg

Prof. Karl Kob

General Hospital Bolzano, Italy

Heinz Kölking

Lilienthal Clinic, Germany

REGIONAL AMBASSADORS

Joan Marques Faner

Son Dureta University Hospital, Spain

Dr. Thomas Kaier

King's College London, UK

Dr. Sergej Nazarenko

Estonian Nuclear Medicine Society, Estonia

Dr. Nadya Pyatigorskaya

Pitié Salpêtrière Hospital, France

Andreas Sofroniou

Limassol General Hospital, Cyprus

Dr. András Vargha

National Centre for Patients' Rights and Docu, Hungary

Anton Vladzimirsky

Virtual Hospital m-Health, Russia

Nikolaus Koller

President EAHM Editorial Board, Austria

Dr. Manu Malbrain

University Hospital Brussels, Belgium

Chris McCahan

International Finance Corporation (IFC) World Bank Group, USA

Louise McMahon

Health and Social Care Board, Northern Ireland

Prof. Iris Meyenburg-Altward

Nursing Medical University, Hannover Medical School (MHH), Germany

Dr. Taner Özcan

MLPCare, Turkey

Prof. Denitsa Sacheva

Council of Ministers, Bulgaria

Jean-Pierre Thierry

Synsana, France

Hans-Peter Wyss

Spital Davos, Switzerland



Yoshimi Anzai, USA
Delivering High-Value Imaging: A Paradigm Shift from Efficiency to Effectiveness p.472



Bram van Ginneken, The Netherlands
How to Integrate AI into Radiology Workflow p.448



David B. Mayer, USA
Use Patient Safety to Improve Your Bottom Line p.471



Boyd Stewart, USA
Revenue Cycle Management p.468



Miguel Cabrer, Spain
Medical Image Exchange in the Cloud: A More Efficient Way p.494



Walter Habenbacher, CNSystems
Closing the Cycle of Research, Prevention, Diagnosis, Monitoring and Treatment With a Simple Finger Sensor p.492



Iris Meyenburg-Altward, Germany
Resilience: The Airbag for Nurses and Other Healthcare Professions p.462



Elia Stupka, USA
Healthcare Data: Creating a Learning Healthcare Ecosystem p.484



Lluís Donoso-Bach, Spain; Alexandre Lourenço, Portugal; Tienush Rassaf, Germany; Christian Lovis, Switzerland.
2020: Another Year of Radical Change in Healthcare p.444



Hans Erik Henriksen, Denmark
Public-Private Partnerships: A Win-Win for Danish Healthcare and for the Industry p.476



Dimis Michaelides, Cyprus
Cultivating Innovation Cultures in Healthcare p.456



Emma Sutcliffe, UK
The ABC of Patient Engagement: Time to Breathe New Life Into Old Stories p.502



Annick Ducher, Ursula Mühle, Germany
The Role of EIT Health in Training the European Future Workforce p.498



Robert S. Kaplan, Michael E. Porter, USA
Measuring Healthcare Outcomes to Deliver Value and Lower Costs p.466



Annemiek Nooteboom, The Netherlands
The Importance of Body Language p.458



Harry Dunsford, Christian Norris, UK.
Measuring the Nation's Health p.460



Alexandre Lourenço, Portugal
New HealthManagement.org EXEC Editor-In-Chief p.436



Robert Pearl, USA
Disruption is Coming to Healthcare p.480



Fred van Eenennaam, Lena van Selm, Marlou Smits, The Netherlands
Digital Transformation for More Effective Healthcare: Inspiring VBHC Initiatives p.489



Mamas A. Mamas, UK
The Future of Cardiovascular Medicine – Technology, Gender Bias and Treatment Strategies p.440



Giuseppe Recchi, Affidea
Beyond Imaging, Towards a Care Pathway Approach Powered by AI p.450



Fiona Gilbert, UK
Leading Breast Radiologist Wins 2019 RSNAC Accolade p.438



Luis Martí-Bonmati, Spain
Creating the Dream Team in Radiology p.446



Caroline Rubin, UK
Bridging the Radiologist Staffing Gap with New Training Initiative p.454

TABLE OF CONTENTS

HealthManagement.org • Volume 19 • Issue 6 • 2019



EDITORIAL

- 429** **Cash Cow**
How healthcare can take control on both macro and micro levels to steer the course towards sustainability.
Christian Marolt, Cyprus



SPOTLIGHT

- 436** **Alexandre Lourenço: New HealthManagement.org EXEC Editor-In-Chief**
HealthManagement.org welcomes on board Alexandre Lourenço as our new EXEC Editor-in-chief.
Alexandre Lourenço, Portugal



POINT OF VIEW

- 450** **Beyond Imaging, Towards a Care Pathway Approach Powered by AI**
Using digital innovations to improve the care pathway and embedding AI into all key operations.
Giuseppe Recchi, Affidea
- 492** **Closing the Cycle of Research, Prevention, Diagnosis, Monitoring and Treatment With a Simple Finger Sensor**
Noninvasive, continuous haemodynamic assessment in clinically proven quality made easy.
Walter Habenbacher, CNSystems

DISCLOSURE

Point-of-view articles are part of the HealthManagement.org Corporate Engagement Programme

- 438** **Leading Breast Radiologist Wins 2019 RSNA Accolade**
Prof. Gilbert has made significant contributions in the field of breast imaging and will receive Honorary Membership at the RSNA Annual Meeting in Chicago this year.
Fiona Gilbert, UK

- 440** **The Future of Cardiovascular Medicine – Technology, Gender Bias and Treatment Strategies**
Prof. Mamas talks about the future of cardiology, gender bias, and how technology can help improve diagnosis, treatment, and prevention of cardiovascular disease.
Mamas A. Mamas, UK



MANAGEMENT MATTERS

- 444** **2020: Another Year of Radical Change in Healthcare**
The Editors-in-Chief for HealthManagement.org share their views on what to look out for in healthcare in 2020 and what we need to do to stay ahead.
Alexandre Lourenço, Portugal; Lluís Donoso-Bach, Spain; Tienush Rassaf, Germany, Christian Lovis, Switzerland.
- 446** **Creating the Dream Team in Radiology**
A modern successful radiology department team needs top-flight professionals in everything from imaging to social media management.
Luis Martí-Bonmati, Spain
- 448** **How to Integrate AI into Radiology Workflow**
Using computer sciences to reduce radiologist burnout, reduce costs and make workflow more efficient and the first steps in implementing the technology.
Bram van Ginneken, The Netherlands

- 452** **Multisociety AI Radiology Ethics Framework Announced**
With AI moving into radiology at lightning speed, international imaging and informatics societies have worked together to produce a paper on ethics guidance.

- 454** **Bridging the Radiologist Staffing Gap with New Training Initiative**
A new credentialing programme seeks to tackle the shortage of radiologists. Dr. Caroline Rubin explains more.
Caroline Rubin, UK

- 456** **Cultivating Innovation Cultures in Healthcare**
It should be the responsibility of leadership to promote a culture for innovation by questioning established cultures and liberating narrow mindsets.
Dimis Michaelides, Cyprus

- 458** **The Importance of Body Language**
Body language and the profound effect it can have on interactions with healthcare colleagues throughout your career.
Annemiek Nooteboom, The Netherlands



Brand New M Family **MX/ME**

Laptop Ultrasound System

3 kg, 44mm thickness

3 screens design

8 hours battery duration



**Meet us at MEDICA2019
Booth 9D05**

*Nov 18-21, 2019
Dusseldorf, Germany*

www.mindray.com | marketingeu@mindray.com



TABLE OF CONTENTS

HealthManagement.org • Volume 19 • Issue 6 • 2019

460 Measuring the Nation's Health
A new health index proposed by the UK government to collect and act upon abundant health data, and facilitate funding allocation.
Harry Dunsford, Christian Norris, UK.

462 Resilience: The Airbag for Nurses and Other Healthcare Professions
Instilling an attitude of resilience in healthcare staff allows them to meet their challenges and effectively recover from setbacks.
Iris Meyenburg-Altwarz, Germany

COVER STORY : CASH COW

466 Measuring Healthcare Outcomes to Deliver Value and Lower Costs
Robert Kaplan and Michael Porter spoke to HealthManagement.org about the ACS THRIVE project for managing costs in healthcare.
Robert S. Kaplan, Michael E. Porter, USA

468 Revenue Cycle Management
With the push to do more with less in healthcare, a majority of provider organisations are working with at least one firm to outsource some revenue cycle processes.
Boyd Stewart, USA

471 Use Patient Safety to Improve Your Bottom Line
A culture of safety not only protects the patient from harm but ensures an open, honest and high-quality healthcare system.
David B. Mayer, USA

472 Delivering High-Value Imaging: A Paradigm Shift from Efficiency to Effectiveness
How can radiologists move towards a model of practice that uses resources and skills effectively and supports high-value care? A leading radiologist and population health scientist explains.
Yoshimi Anzai, USA

476 Public-Private Partnerships: A Win-Win for Danish Healthcare and For the Industry
The Danish model shows that when Public-Private Partnerships work, they can usher in innovation and solutions previously regarded as out of reach.
Hans Erik Henriksen, Denmark

480 Disruption is Coming to Healthcare
No industry that operates as inefficiently and ineffectively as healthcare has survived disruption in the 21st century. Why does medicine remain the exception and what forces can improve quality and bring costs under control?
Robert Pearl, USA

484 Healthcare Data: Creating a Learning Healthcare Ecosystem
The future of global healthcare requires a shift towards a real-time, digital learning healthcare ecosystem, but how can we use patient data to achieve this goal?
Elia Stupka, USA

489 Digital Transformation For More Effective Healthcare: Inspiring VBHC Initiatives
By combining digital transformation with the core VBHC initiatives, we can provide effective, patient-centred care for the future.
Fred van Eenennaam, Lena van Selm, Marlou Smits, The Netherlands

493 Cash Cow Infographic
An overview of healthcare industry revenue, growth and expenditures.

WINNING PRACTICES

494 Medical Image Exchange in the Cloud: a More Efficient Way
In the drive for patient engagement, what benefits does cloud computing have over delivery formats of imaging records widely used today?
Miguel Cabrer, Spain

498 The Role of EIT Health in Training the European Future Workforce
EIT Health, a network organisation supported by the European Union, is addressing the impact technology is having on both healthcare employees and end user patients.
Annick Ducher, Ursula Mühle, Germany

502 The ABC of Patient Engagement: Time to Breathe New Life Into Old Stories
A medical communications expert looks at how industry's relationship with the patient has changed over 25 years and what is necessary for successful future liaison.
Emma Sutcliffe, UK

I-I-I BLOG

506 Hisam Alahdab
Chief Operating, Quality and Safety Officer - Anadolu Medical Center, Turkey

Immanuel Azaad Moonesar
President-AIB-MENA & Assistant Professor of Health Policy - Mohammed Bin Rashid School of Government, Dubai

Majeda Afeef Al-Ruzzieh
Chief Nursing Officer - King Hussein Cancer Center (KHCC), Jordan

Girish Srinivasan
Co-founder & Chief Technology Officer Technology Solutions Leader / Bio & Computer Engineer - PhenoMx, Inc., Palatine, USA



Leading independent provider of Advanced Diagnostic Imaging, Outpatient and Cancer Care services in Europe

273

medical centres

16

countries in Europe

9400

professionals

7

million

patients / year

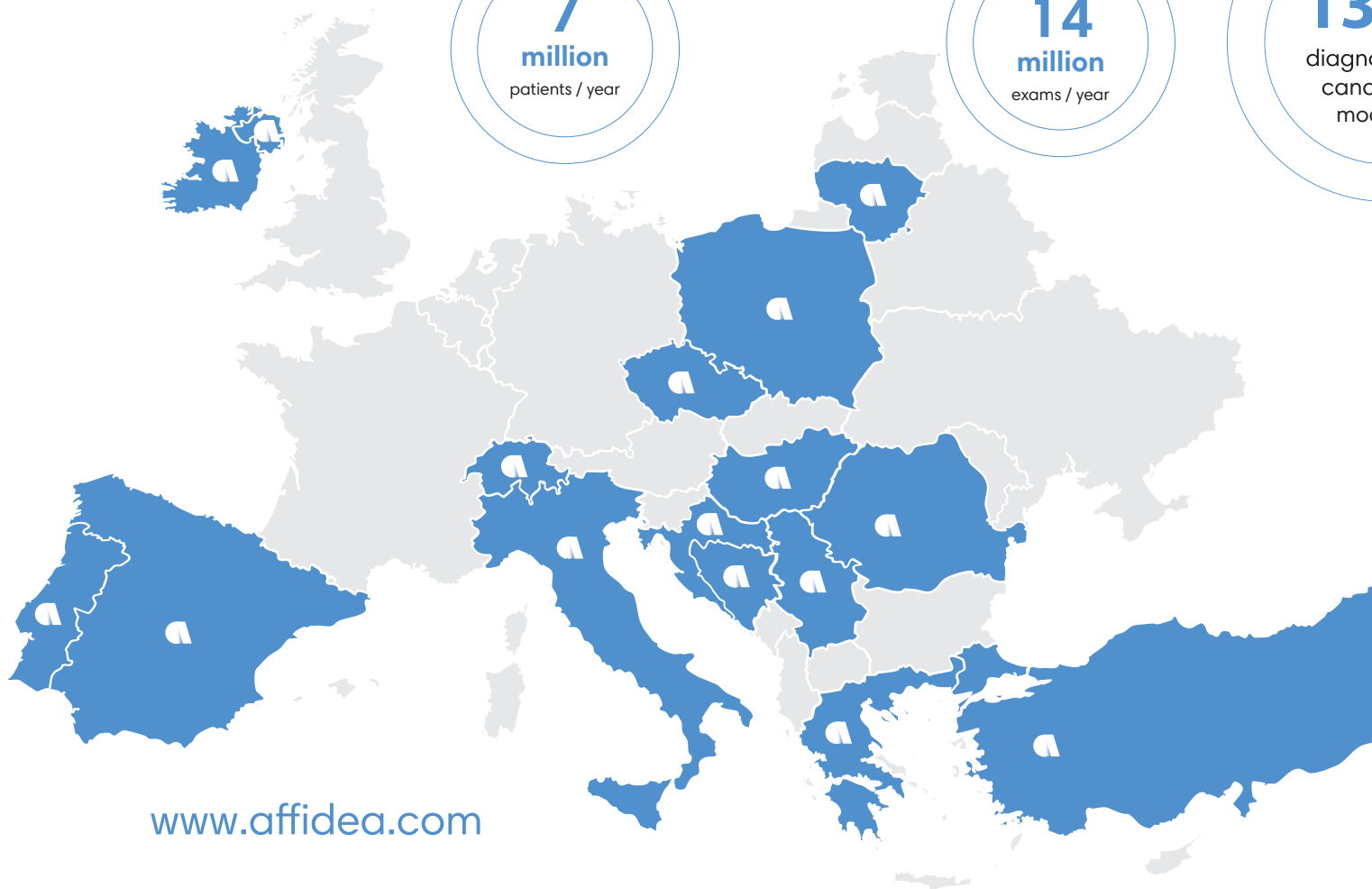
14

million

exams / year

1323

diagnostic and cancer care modalities



www.affidea.com

Alexandre Lourenço: New HealthManagement.org EXEC Editor-In-Chief



HealthManagement.org is proud to welcome on board Alexandre Lourenço as our new EXEC Editor-in-Chief. Lourenço serves as President of the Portuguese Association of Hospital Managers, Board and Executive Committee member of the European Association of Hospital Managers (EAHM), Board Member of the European Health Management Association and Honorary Fellow of the Brazilian College of Health Executives. Additionally he is an Affiliate Member of Nova SBE Health Economics and Management Knowledge Centre and Guest Lecturer on Healthcare Management Executive Training Programmes at the Católica Lisbon School of Business & Economics and NOVA SBE. He works as Hospital Administrator at Coimbra University and Hospital Centre, the major hospital in Portugal with nearly 2,000 acute beds. Since 2014, he has been a consultant for the World Health Organization, providing technical assistance on health systems' strengthening and financing. He is also Vice-Chair of the Technical Advisory Group on Tuberculosis Control for WHO-E. Lourenço has also co-authored several healthcare policy documents, book chapters, scientific papers and has presented keynote talks all over the world. Let's meet Alexandre Lourenço.

How do you feel about taking over the position as EXEC Editor-in-Chief at HealthManagement.org?

I am very honoured to start this position. HealthManagement.org has been offering exceptional content, providing worldwide readers the opportunity to acknowledge the global trends and breakthroughs in healthcare. In such a complex and heterogeneous area, HealthManagement.org has been able to identify experiences and gather opinions that matter. I hope to support this journey as best I can.

What are your editorial aims for the publication and readers?

Healthcare managers are a tough target to reach due to the pressures of their work. In this sense,

I aim for healthcare managers to find in the publication solutions and ideas that can be useful in their daily activity. For that, we need to be able to attract the most prominent peers to share their innovative experiences. Not less important, HealthManagement.org should be a beacon for healthcare managers by promoting competence, good governance, ethical behaviour, and patient-centred approaches. Lastly, we really need to listen to and learn from patients.

It is essential to clarify that when I say healthcare managers, I don't mean only C-level positions. We also need to consider all personnel that have management roles, including department directors, chief nurses, etc. HealthManagement.org integrates different views and is readable by a broader audience without losing technical quality.

What are your key focuses and interest in healthcare management?

My research work is mostly related to how governance and healthcare managers' competencies impact on the overall performance of hospitals. I have also been working on other topics such as financial mechanisms (eg payment models) and on how we can develop new models of care that are more people-centred to improve value for patients, families, and communities.

What do you see as the major challenges in your field?

Healthcare is one of the most exciting and innovative industries of the 20th century, and hospitals are some of the most complex and sophisticated organisations ever developed. It

is fascinating to have the chance to work in this area. Nonetheless, in spite of the high level of sophistication that we have achieved, most of our processes are organised as they were more than 50 years ago highly fragmented, verticalised, passive, acute-centred etc. I believe that our main challenge is to redefine/ redesign the model of care by integrating different partners (not only healthcare providers) to provide more people-centred care and, in the end, more value to the population.

"I BELIEVE THAT OUR MAIN CHALLENGE IS TO REDEFINE AND REDESIGN THE MODEL OF CARE BY INTEGRATING DIFFERENT PARTNERS TO PROVIDE MORE PEOPLE-CENTRED CARE"

What are the three most common mistakes hospital managers make and how can they be prevented?

Healthcare managers have a tremendous responsibility to create the best conditions to maximise the competencies and skills of healthcare professionals and to assure more and more people-centred approaches. At the same time, we need to use our resources efficiently and create value for the organisation.

To achieve these goals, we need to be humble and learn with patients, families, and healthcare professionals. In fact, managers need to be continuously studying and learning. Too many times, I have seen much arrogance and a feeling that 'I know everything.'

What three factors define a successful health administrator?

The success factors are entirely related to common mistakes. To be successful, you need to be technically prepared with what we usually call hard skills. I really don't believe that you can be a top-level manager without having a good notion about financial management or clinical pathways. Also, soft skills are needed. You work under tremendous pressure with highly differentiated workers. Also, you need to be sensitive to patient and family needs.

To achieve this complicated triangle, we need to be humble and learn from experience, to be a team player, engage the personnel and, of course, to work and study to improve our competencies and skills.

Should healthcare management be led by those with a medical background or a financial background?

Healthcare management needs to be led by competent leaders independent of the background. From experience, I have seen medical doctors and financiers that are terrible. I've also seen the opposite. Healthcare management is a multidisciplinary science and depends heavily on teamwork. It requires some distance from practice to see all the forest. So medical doctors or other healthcare professionals that are in management positions need to refocus and to learn management competencies and skills. Managers need to learn about the healthcare spectrum and engage with healthcare professionals. Innovation is a more complex issue; good healthcare managers are not necessarily innovators even

though they need to understand its value and how to promote it.

Do you feel that new remote health monitoring technology is cost prohibitive for the health management of the ageing population?

I believe that remote monitoring is showing good results. For the last few years, my hospital has been using this kind of technology for chronic obstructive pulmonary disease and, more recently, cardiac insufficiency, both with outstanding outcomes.

Remote monitoring can also be beneficial in acute home hospitalisation programmes and major ambulatory care, reducing inpatient admissions and length of stay.

This technology is instrumental in redesigning the model of care by integrating different providers (including social partners and informal caregivers) to address the ageing population needs in the community.

What is your top tip for aspiring healthcare managers?

Be open. This is a team player job. Study hard and work on soft skills. This is a demanding and tough job but also, individually rewarding. At the end of the day, our work impacts the lives of individual human beings who, most of the time, are in extremely vulnerable situations.

■

Leading Breast Radiologist Wins 2019 RSNA Accolade



Prof. Fiona Gilbert is a leading light in the field of breast imaging with her contribution to the field being marked with Honorary Membership at Radiological Society of North America (RSNA) annual meeting in Chicago this December. Since her graduation from Glasgow University in 1978 she has built an illustrious career in the UK in multiple areas of clinical research and writing, breast screening, and lecturing. She is Vice-President of European Society of Breast Imaging becoming President next year. She is Chair of the breast scientific programme committee of RSNA, past Chair of the research committee of the Royal College of Radiologists and past Chair of the NCRI Imaging Advisory Group. Her current research interests are using multimodal imaging to better understand the tumour environment, supplemental imaging for dense breast and risk based screening, non-FDG radiotracers in cancer, and breast MRI. Prof. Gilbert is also Professor of Radiology and Head of Department at Cambridge University and Honorary Consultant Radiologist at Addenbrooke's Hospital in Cambridge. HealthManagement.org caught up with her in her busy schedule to discuss what she sees for the future of breast imaging and how she feels about RSNA recognition.

At the Radiological Society of North America (RSNA) annual meeting this year, you will receive Honorary Membership for your services to radiology. How do you feel about receiving this accolade?

I'm really surprised and absolutely thrilled. The annual scientific meeting of RSNA is one of my most favourite meetings and I've been going to it since I was a registrar. I have loved my career in Radiology and feel so fortunate to have been in the specialty at a time of amazing technological innovation. Receiving honorary membership is a huge honour. It is wonderful recognition for all the teams of people with whom I have worked delivering trials and undertaking research over many years.

One of your interest areas is using imaging to better understand tumour physiology. How do you think the current screening methods/ modalities can be better leveraged individually or together to improve insight into tumour make-up?

One of the problems with screening programmes is that we want screening to pick up all of the disease but, the problem is, we pick up some cancers that a woman would never have known about – this is termed 'overdiagnosis.' Overdiagnosis can cause alarm and anxiety and labels someone as a cancer sufferer – if she had not attended for screening she would never have known about the cancer. With new technologies we need to ensure we are reducing

overdiagnosis and only finding the biologically aggressive cancers that are going to cause harm. We need to try to identify those individuals who are most at risk of developing a cancer that's going to kill them. We think that we can do this by using the genetic information, breast density and other risk information. The other thing we can do as radiologists is use different imaging modalities that are more likely to pick up the aggressive cancers. We know that high-grade cancers tend to be more vascular. We think that a vascular imaging technique where you inject contrast, such as MRI or contrast-enhanced mammography, will be more likely to pick up the aggressive cancers than the less aggressive cancers. Now we have a long way to go to prove that, but that's the rationale about shifting towards using a vascular-based technique to try and identify

abnormalities, so that we find the killer cancers instead of the less-worrying cancers.

How far off do you think we are from this?

There is some evidence from the MRI studies like the DENSE trial and Abbreviated MRI studies. We need to look at those screening MRI studies and look at what kind of cancers are being found – the size of the cancer, the grade and type of the cancer. Following this, we need an analysis of all the published MRI studies to see the type of cancer being detected by MRI rather than mammography, ultrasound or contrast-enhanced mammography. Are there differences in the cancers found with the different imaging modalities or are they just the same? In theory, those modalities with an intravenous contrast injection should be more likely to pick up the aggressive cancers that are more vascular.

What do you think the future holds for tomosynthesis? Does it have potential to work by itself or is it better if it works in alliance with other modalities?

There's a huge amount of evidence around tomosynthesis. The companies are now producing high-resolution tomosynthesis images. The processing is now much better compared to the earlier studies and we can now see microcalcification more clearly. There are tools to help us read the large numbers of images in the data sets. Women with mixed density breast tissue gain some benefit from tomo compared to 2D mammography but those with extremely dense breasts probably don't and they need supplemental imaging.

How will AI develop in breast imaging and is it a tool which will add value in your opinion? What are the risks?

I am very excited by AI. I think it presents huge opportunities and we can use it in different ways. The good thing is that there is a lot of research going on in the mammography field to help us read mammograms, triage the examinations and sort those examinations into those which are highly likely to have an abnormality where the radiologist should be really focusing their attention and their efforts so that they don't miss something.

**"WITH NEW TECHNOLOGIES WE
NEED TO ENSURE WE ARE REDUCING
OVERDIAGNOSIS AND ONLY FINDING THE
AGGRESSIVE CANCERS THAT ARE GOING
TO CAUSE HARM"**

Compare this to those cases with a very low likelihood of an abnormality being present. With AI, we can read them at the end of a busy afternoon, not so much that we pay less attention to them but more if we find nothing in the batch with the very low probability we're not anxious about it, we are reassured that a machine has also read them. I think it's useful to have marks bringing your attention to a particular abnormality but it's not useful if there are too many marks. This discourages us from using the tool because we lose confidence in it and start ignoring the marks inappropriately. A large study showed that the performance of radiologists working with Computer Aided Detection (CAD) is worse than those not using CAD. So, I think that some people benefit more from AI tools than

others. Some work has shown that with radiologists who are low-volume readers, performance can be enhanced by using the CAD systems, whereas there's less of an impact on high-volume readers. Some countries have double reading – two people looking at the images. With adoption of AI this could replace one of the readers. We will use it in some way to save manpower or redistribute the manpower.

What's exciting you the most about your current research?

One of the things that I really want to do is move screening to a risk-based, stratified system where the most appropriate imaging is given to a particular individual so they have their own personalised screening at a frequency according to their risk.

Can we personalise the care for those with cancer?

Absolutely. I would like to find ways to integrate the functional information that we can get from our amazing MRI scanners and PET scanners. We can better identify biomarkers that say 'this woman would respond better to this treatment' or 'this woman would respond better to that particular drug.' After only one course of chemotherapy, you can see what's happening in the tumour with imaging – which areas are responding and which areas aren't. People who undergo chemotherapy have such a difficult time. We need to try and tailor it much better; I believe imaging can contribute to this much more than we're using it at present.

The Future of Cardiovascular Medicine – Technology, Gender Bias and Treatment Strategies



Prof. Mamas A Mamas is a structural interventional cardiologist, treating patients with underlying coronary artery with percutaneous coronary intervention (PCI) in both the elective and emergency setting and undertaking Transcatheter Aortic Valve Interventions (TAVI). He is also the Associate Editor of Circulation Cardiovascular Interventions and leads a large research groups focussed around electronic health record research. HealthManagement.org spoke to Prof. Mamas about the future of cardiology and how technology can help improve diagnosis, treatment, and prevention of cardiovascular disease and how the gender bias in cardiology could be tackled.

There is a great deal of discussion these days on the lack of women in cardiology as a profession. Why do you think that is?

One of the primary issues, in my opinion, are perceptions of the profession. So often, when people have exposure to cardiology as a specialty whilst as medical students, there is the obvious lack of female role models. If your first experience of a specialty is in a very man-orientated setting, you may feel that there is no one that you can identify with; that there is no role model. It's like when you are a child, and you want to do something, you look for role models. And if there are not any role models, you may think that this job is not for me. At the end of the day, our career choices are often informed by our experiences as medical students, and if you see a specialty full of white middle-aged men, and you are not from that demographic, you are not going to be able

to identify with or feel that you belong to that profession.

I also think cardiology training is very long, and I think women are disadvantaged in many ways in that it's not really a family-friendly specialty. Therefore, many women are put off entering into this specialty by the competing considerations around wanting children, and wanting a family life. I think that the profession itself hasn't really been that innovative in thinking around what are the training needs of men vs. women. It is very much a one-size-fits-all and that one size is very man-centric. The field of cardiology doesn't really consider that perhaps the training needs of women have to be more flexible – flexible around motherhood. It also needs to be more innovative. As medical students, you start from A, you carry on training, you finish at B, and you go on and become an attending without the

thought that half of our attendees may want or may need to take time out to have a family. I don't think the profession is particularly supportive and neither are the training systems. For example, if you look at both training and meetings, there aren't any facilities to cater to women and their families. Looking at it from my perspective, I have often said to female members of my group that they can use my office if they need to breastfeed. But you shouldn't have to do that. At the end of the day, the institution should provide facilities to women. Similarly, at meetings, why is it that women can't bring children to meetings if they wish to do so? Why are there not breastfeeding facilities for women? Why are there no crèches where women can keep their children to help them attend meetings?

Another factor is that often, when you have meetings, it's who gets to the table. When

you go to a meeting, and you see a symposium or a session where the whole panel is white and male, how representative is that of the wider profession? I'm not saying that you should give talks or panel memberships just to women by virtue of their gender; I'm saying there are lots of very accomplished women in our field. Why are they not in the panel? Why are they not on the podium? You can't tell me that for many of these sessions there is not a single woman or a single individual of ethnic origin who does not have sufficient expertise to be on the panel.

There is a lot of uncomfortable discussions that need to be had around what we need to do to make our profession more visible and open to people. And it's not about being open to minorities. Women are 50% of the population. How do they get equality? There are a number of ideas and things we can do to address this, and I think that it is a much-needed change because when you have a profession, and it only consists of a small minority of the population, it's not good for the profession. At the end of the day, we deliver a service, and if our profession is not made up of the wider population, we cannot deliver our service effectively and it will not resonate with our end-users.

What about the lack of treatment strategies and protocols that consider sex and gender impact when treating cardiovascular disease? How can we tackle that?

The treatment paradox is that often patients that are at a greater risk of adverse outcomes are less likely to receive optimal treatments. Women fit this treatment paradox. For example, after a heart attack, women are at a higher risk of having adverse outcomes, and

yet they are less likely to receive optimal care. People often say that women present with atypical features. I think that's wrong. Why is it atypical? It's typical for a woman. How can 50% of the population present with atypical features? You have got to then define what is a typical feature. Part of it may be the way that women use language to discuss symptoms. It may be slightly different from men. But that doesn't make it typical or atypical. It just makes it different. Actually, there are more similarities than differences, and this perception that somehow women have atypical symptoms is probably more of a myth than reality.

Also, we are not identifying women as being at risk of cardiovascular disease, and we do not recognise it when they present with cardiovascular disease. Diagnosis of women often takes much longer, and in effect, it takes longer to apply evidence-based treatments for women. This may be due to our own perceptions and our own biases. From medical school we are taught by men that it is men who are more likely to have heart attacks and cardiovascular disease and in women it is not that common. This is also a complete myth. Cardiovascular disease is the most common cause of mortality in women. It's more of a cause of mortality than cancer, and yet we fixate on cancer, and we don't think about cardiovascular risk. There is a lot of data to suggest women don't get treated optimally. Why? Perhaps it has to do with the perception of risk in women. So even though you diagnose a woman with a heart attack or another event, one of the problems is that physicians may think that women, for some reason, will not benefit from an intervention or the risks from the intervention are too high. And again, we see this consistently in our work, and other peoples work that after a heart attack women are much less

likely to be offered an angiogram, much less likely to be offered a PCI, even though they benefit from these interventions as much as men.

What we have to do as a community is to recognise that women have a huge burden of cardiovascular disease, and once we have recognised it, to offer women the same treatments and the same access to treatments that we offer men. I don't think it is appropriate that women are 20% less likely to receive cardiac catheterisation following a heart attack than a man is. There is no biological reason for that. It is absolutely unacceptable that women are getting substandard care compared to men. One way to address this is to broaden the workforce because women are not making these decisions. If we have a workforce that is more reflective of the patients we treat, the biases that we have pertaining to provision of treatment will be a lot less.

They say that cardiology still lags behind other specialties when it comes to embracing digital health technologies. Do you agree? And if yes, why is that? How do you think this can be improved?

I personally think that cardiology is ahead of many other specialties, but I don't think we use digital health effectively. I think one of the reasons is that digital health is often associated with an upfront cost. The healthcare system that we work in has a fixation on the upfront cost rather than the bigger picture.

There are also a lot of services that aren't conditioned towards digital healthcare solutions. A lot of the services that we offer as doctors are 9-5 services. The issue around digital health is that it

is not 9-5. The information is delivered 24/7. The question is about how we can access this information 24/7 for services that are delivered 9-5? How do we action this information because there is no use capturing this information unless you can action it. There is no point collecting this information 24/7 unless you can do something about it 24/7. Services aren't structured around that. There is also the question of what we can do with all this information. A lot of it is being collected from devices that we're implanting as cardiologists such as pacemakers, smartwatches, telemetry and so forth. But what do we do with this information and how can it improve what we are doing already? Does it impact on outcomes? This is the big challenge for us as a community. It's understanding what this information can add to the model of delivery that we have currently and how it can change patient outcomes.

You are one of UK's top health pioneers. Your data analysis skills and your focus on personalising patient treatment is a leading reason for this. What is your motivation behind this? How do you think Big Data can help cardiologists?

Big Data can mean many things. My interest is electronic health care data, which is patient records. Every time you see or interact with a healthcare provider that might be a doctor, a nurse, or a pharmacist, data is created and stored. My group's interest is using this data to study outcomes of patients and to study effectiveness of treatments for patients and develop risk models. But Big Data can be

many other things. It can be imaging data. Every time you have a chest X-ray or a CT scan or a heart scan, that is also data. Every time you wear a smartwatch, that is also data. Data is produced from procedures that we do for example, intravascular imaging during PCI or data derived from healthcare like pacemakers. Again, that is data. It is about looking at all these different types of data and determining how we can use this data or combine this data to help individualise patient treatments and whether individualising treatments by using this very different data is actually better than the one-size-fits-all approach. There is not really much point collecting this data if it doesn't impact on outcomes. We can develop lots of clever risk models, but if the risk models don't change what we do for patients and don't change their outcome, there is no point.

Cardiology is increasingly recognising the value of personalising approaches to patients, but it is then about trying to refine our ways of predicting outcomes. Traditionally we have used electronic health care record data. Now the challenge is to use other data – imaging data, blood result data, genetic data – and incorporating this information into risk scores and algorithms. Traditionally, we developed these risk scores and risk algorithms using traditional statistical models, but now we're using much larger datasets and different types of data. That's where machine learning and artificial intelligence comes in. There are a lot of new scores being developed now using artificial intelligence where we are using different types of data. The big question to me will be whether these scores will impact patient outcomes or change how we deliver treatments to patients. If we have developed a risk score, we should test its function

and whether it changes how we do things or patient outcomes. That should be the endpoint of the risk score, not the risk score itself.

Can you give us some insight as to what measures you think could further improve cardiology practice?

I could talk about my interest in acute coronary syndrome and interventional cardiology. Lots of the data that we measure are related to hospital outcomes and hospital complications. Mortality is a rare event, so we need to think about other important things that occur commonly and that have a big health economic impact and, most importantly, a patient impact.

These include things like patient complications post-discharge. We often think about in-hospital complications, but what about post-discharge complications? What about post-discharge readmissions? 1 out of 10 patients following a PCI or a heart attack and 1 out of 5 patients after a heart failure event will be readmitted after 30 days. Why don't we have risk scores that can predict these? We also need to understand how the patient feels and what is important to the patient. We do interventions, and we provide treatments. We should also determine how this treatment makes the patient feel – we need to incorporate patient-relevant outcome measures. For example, we are not offering PCI for the prevention of heart attacks; we're not offering it to the patient to live longer. We are offering it for patients to feel better. Why is it then for assessment of outcomes, we only look at risk of mortality in 30 days, risk of readmission

in 30 days or risk of complications at 30 days? Why are we not asking patients if the intervention has helped them feel better? I think it is about taking a step back and thinking of more patient-relevant endpoints as well.

"THE TREATMENT PARADOX IS THAT OFTEN PATIENTS THAT ARE AT A GREATER RISK OF ADVERSE OUTCOMES ARE LESS LIKELY TO RECEIVE OPTIMAL TREATMENTS"

You are very active on Twitter and a very vocal advocate of how SoMe can help clinical education. Why do you feel so strongly about this?

You can look at it from two perspectives: the population perspective and the healthcare provider perspective. One impacts the other. Looking at it from the healthcare provider's perspective, I think social media is fantastic. It helps provision of education across different healthcare providers that include doctors, scientists, and other health professionals from all over the globe. SoMe helps you to interact with these people on a daily basis. It promotes education. Having someone, a doctor who is partaking in discussions from all over the globe and learning from colleagues from all over the globe and becoming

familiar with new data from all over the globe in real-time will only be a benefit to patients. SoMe is also great as it gives us a support network. You develop friendships. That is particularly important in a profession where you have very high rates of burnout.

From a patient perspective, it can help develop patient networks. You can see what treatment options are available. It can show you the importance of risk factors, controls, and lifestyles. You get some amazing patients that share their experiences and their strategies to improve their health and lifestyle. There are real patient advocates. SoMe can be an excellent resource for patients.

Our cover story for this issue focuses on the healthcare bottom line and how rising costs are a big challenge. Innovation and technology could possibly save the day. How accurate do you think that is for cardiology? How do you think the economic burden of cardiovascular disease can be handled effectively?

Number one is to prevent cardiovascular disease from developing, and for that, I strongly believe lifestyle is the key. Our population is getting heavier, more sedentary. The government has a responsibility, and they can help. For example, tax deductions can promote healthy activity, and can offer incentives for gym memberships. Nowadays, many of the schools in the UK are selling their playing fields to property developers, so children don't have spaces to run and be active. I think exercise should be emphasised even at a young age. I think healthier

lifestyles, encouraging people to lose weight, making activities in gyms and gym membership cheaper can really help prevent cardiovascular disease.

As for secondary prevention, we could change the way we deliver healthcare by using more digital solutions. Many practices are open 9-5, and that's not conducive for people to visit as often, especially people with low incomes who can't afford to take a day off work. We need to be more innovative about how we deliver healthcare, such as evening clinics, or weekend clinics, which people are more likely to visit. We also need better screening in high-risk populations, and include patients from different backgrounds. For example, people of South East Asian background have an increased risk for future cardiovascular events. We know that individuals such as these don't often have much in the way of contact with their healthcare providers. By diversifying our healthcare workforce, we could improve engagement if the doctors that these communities are being served with are from their community. We need to capture people and deliver healthcare in people's communities rather than the traditional practice model of 9-5.

Screening for cardiovascular disease, promoting lifestyle changes, reducing obesity, reducing smoking, and making people more active can all help reduce the prevalence of cardiovascular disease.

2020: Another Year of Radical Change in Healthcare

As we approach the New Year, it is time for forecasts and predictions. This is not easy, as the healthcare landscape today is changing faster than ever, driven by technological advancements and accompanying social, financial and regulatory shifts. The Editors-in-Chief for HealthManagement.org shared their views on what to look out for in 2020 to ensure you stay ahead.



Alexandre Lourenço

Editor-in-Chief EXEC
President
Portuguese Association of Hospital Managers
Lisbon, Portugal

alexandre.lourenco@apah.pt

@LourencoAlex

There are a number of key developments that we should start considering in the near future, including but not limited to, areas such as care models, Big Data and market balance.

Innovative and integrated patient-centred models of care will continue to emerge. These will be mostly focused on the community and leveraged by the spread of recent technologies (eg remote monitoring).

Developments in Big Data will be going on with baby steps. Although some anecdotal evidence will be available, we are still unable to see the big picture.

Introduction of new medicines (mainly in oncology) will take precision medicine to a new level challenging the health system finances and universal access to care. Payers will push for value-based healthcare, and new payment models will gain momentum accordingly.

On the market, heavy technology suppliers will continue to push for services contracts, trying to abandon the acquisition model that is highly dependent on the fluctuation of capital availability. Also, new players will enter the healthcare sector without having a real impact on the market.

Finally, in general, the agenda on healthcare management 'professionalisation' will continue to grow and to influence policy makers and other stakeholders.



Lluís Donoso-Bach

Editor-in-Chief IMAGING
Head of Diagnostic Imaging
Hospital Clinic of Barcelona
University of Barcelona
Barcelona, Spain

ldonoso@cspt.es

@ldonosobach

Radiologists need to take into account a few key factors, managerial, clinical and operational.

On the managerial front, the overall hospital strategies are becoming more democratised and ways of implementing various imaging modalities are changing. Thus, the need for radiologists to develop leadership skills is going to grow tremendously. Radiologists will need to very clearly convey their viewpoints to a wider team of colleagues, so the training will be required to adapt to this. The matter of burnout stays in the forefront, so we have to effectively assess how Artificial Intelligence and Machine Learning can mitigate it.

Speaking from a clinical point of view, there are several areas to keep our eyes on but one that stands out is, of course, radiogenomics. The exciting trend of genomics and imaging merging will facilitate personalised disease identification leading to more efficient treatment.

When it comes to operations, naturally, the move to value-based healthcare will continue to direct much of our general strategy, practice and treatment.



Tienush Rassaf

Editor-in-Chief CARDIOLOGY
Department Head and Chair of
Cardiology and Vascular Medicine
Westgerman Heart and Vascular Center
University of Essen, Germany

Tienush.Rassaf@uk-essen.de

 @UniklinikEssen

We have already seen significant advancement in cardiology over the last few years. This trend should continue in the years to come. There will be continued advancement in transcatheter valve technologies and the use of catheter-based interventions should increase in the future. The use of artificial intelligence to identify patients at risk of cardiovascular disease will also increase. This will enable a preventive approach rather than a treatment approach to cardiovascular disease by early identification. AI will also be applied in cardiac imaging to reduce time and to identify any irregularities before complications occur. There will be increased application of precision medicine and using genetic information to assess patients and determine who can benefit from specific interventions. Remote monitoring of patients through wearables and other remote devices with the ability to generate patient data will be a useful tool in future and there will be greater focus on developing improved drug treatments that not only improve patient outcomes but also have better safety profiles.



Christian Lovis

Editor-in-Chief Healthcare IT

Professor and Chairman
Division of Medical
Information Sciences
University Hospitals of Geneva (HUG)
University of Geneva (UNIGE)
Geneva, Switzerland

Christian.Lovis@hcuge.ch

 @chr_lovis

We live in the most exciting time ever. There have never been so many and such swift scientific and technical advancements concentrated in so few generations. But to unlock this power, we now need cooperation rather than competition. We need to better share the learnings, the successes, and the failures.

The most important upcoming trends are:

- Complexity
- Education
- Security
- Ecosystems

The level of complexity in all aspects of healthcare is steadily increasing, with Artificial Intelligence slowly coming into practice, some usages are moving faster ie image recognition, and billing and automatic encoding. Hospitals are actively implementing technologies such as cloud storage and computing, reinforced by the increasing usage of personal devices. In addition, everything gets connected, from fridges to prosthetic materials, and the number of connected devices keeps growing. Care networks, personal records, and advanced planning now require hospital systems to become fully integrated with the rest of the world, locally, regionally, and even globally. As a result, the IT roles and functions mutate constantly while the boundaries of IT department activities are getting fuzzy.

All of the above create another important trend: the necessity of proper education. This 'world of IT' requires multidisciplinary approaches, hyperspecialists in multiple fields. These pearls are really hard to find, and even harder to keep.

Security is another matter we will be looking deeper into. IT is becoming the single most critical point of failure for an organisation.

One of the upcoming challenges might be to develop specific strategies to move into the disinformation society. Spam, fake news and cyber attacks are building a new type of pressure and overall threat.

Creating the Dream Team in Radiology

Summary: A modern successful radiology department team needs top-flight professionals in everything from imaging to social media management.



Luis Martí-Bonmatí

Department of Radiology
GIBI230 Research Group
on Biomedical Imaging
Hospital Universitario y
Politécnico and Instituto
de Investigación La Fe,
Valencia, Spain

luis.marti@uv.es

iislafe.es/

@IISLaFe



In the 90's the term 'Dream Team' was used to name a Marvel Comics' group of superheroes with different magical energies, surprising powers and marvellous skills.

Today, most people associate the term Dream Team with the 1992 Olympics U.S. men's basketball team, the first American Olympic team to feature players from the National Basketball Association. In management, the term Dream Team is considered to designate a set of leaders who are hard to come by. For us in radiology, a Dream Team means the cohort of top-flight leaders helping the chair to foster the long-term success of the department, a sort of Praetorian Guard (the elite bodyguards to Roman Emperors). A strong Dream Team generates recognition and waves the flag of radiology practice excellence. The more accomplished the leaders within the Dream Team, the higher is its recognition.

Dream Team members need to be carefully selected and strongly empowered. Although faculty is the professional nucleus of a department and the main source of information and insight (Thrall and Fessel 2019) other professionals (including nurses and technologists), should also be part of the Dream Team. To foster the visionary projects and initiatives that maintain the growth and prosperity in a radiology department, there are a number of skills each team member needs to have. From excellent communication skills to expert negotiating tactics, the Dream Team needs to work together to continuously bring innovative business to the group.

Dream Team members should cover all the strategic positions. Some positions can have more than one leader, but all positions should be covered in order to have a well-balanced structure. The key Dream Team positions include:

- Research and clinical trials.
- Education and certification.
- Clinical practice and innovation.
- Interventional and targeted therapies.
- Artificial Intelligence.
- Quality improvements and process optimisation.
- Patient safety and experience.
- Integrated diagnosis (radiology, pathology, genetics); and
- Communication (patients, students, news, social media).

Dream Team members should encourage organisational change practices (Gilmore and Lundström 2019).

- Multidisciplinary core team from all organisation layers with the right emotional commitment and skills.
- Simple, compelling vision and strategy.
- Successful communication to the department.
- Removal of roadblocks by enabling constructive feedback.
- Set ambitious but realistic goals.
- Eliminate all forms of waste; and
- Incorporate change as a core element of organisation development.

The Dream Team should promote an effective alignment between management (desired state perspective) and staff (present state perception) views to implement step by step the necessary actions.

Quick-win solutions on the improvements of organisational practices will enforce the team building and feeling of success (Martí-Bonmatí 2016).

Transformational leadership style stems for our moral commitment to change for the betterment of an organisation, through inspirational engaged followers. Close to 70% of organisational change management and innovation projects fail. Building the right team as a guiding coalition assures intellectual stimulation; increased sense of urgency; getting the right and coherent vision; communicating the vision for buy in; empowering ethical actions and followers; creating short term wins and anchoring changes in the corporate culture (Martí-Bonmatí 2016; Thomson et al. 2016).

"FROM EXCELLENT COMMUNICATION SKILLS TO EXPERT NEGOTIATING TACTICS, THE DREAM TEAM NEEDS TO WORK TOGETHER TO CONTINUOUSLY BRING INNOVATIVE BUSINESS TO THE GROUP"

In summary, the Dream Team will succeed if the organisation: reduces clinical and technical errors and mistakes; improves patient outcomes by lean approaches; increases productivity while decreases cost; improves employee, clinician and patient satisfaction; fosters continuous research and education; uses performance metrics in the entire process; innovates driven by better images and computing and participates in innovations important to radiology. Examples of such initiatives include:

- Clinical trials with imaging data.
- Real world data repositories with proven evidence.

- Structured reporting and big data generation.
- Artificial Intelligence; and
- Image-guided therapy.

Acknowledgment:

Part of this manuscript was presented at the European Congress of Radiology (March 2019).

KEY POINTS



- A Dream Team is made up of leaders who are hard to come by.
- A radiology Dream Team is a group which helps the chair to foster the long-term departmental success.
- The team should cover all strategic positions in a department.
- Innovation is key to a team's success.



REFERENCES

- Martí-Bonmatí L et al. (2016) Organisational change in newly integrated medical imaging departments: increase commitment by team involvement. *HealthManagement.org Journal*, 16(3):258-265.
- Lundström et al. (2017) PR Integrated Diagnostics: The Computational Revolution Catalyzing Cross-disciplinary Practices in Radiology, Pathology, and Genomics. *Radiology*. 285(1):12-1.
- Pinto Dos Santos D, Baeßler B (2018) Big data, artificial intelligence, and structured reporting. *Eur Radiol Exp*, 2(1):42.
- Thomson NB et al. (2016) Transformation and transformational leadership: a review of the current and relevant literature for academic radiologists. *Acad Radiol*, 23(5):592-599.
- Thrall JH, Fessell DP (2019) Onboarding of New Radiology Department Chairmen. *J Am Coll Radiol*, pii: S1546-1440(19)30715-X.

How to Integrate AI into Radiology Workflow

Summary: Where do the computer sciences have the potential to reduce radiologist burnout, reduce costs and make workflow more efficient and what are the first steps in implementing the technology?



Bram van Ginneken

Professor of Medical Image Analysis
Radboud University Medical Centre
Nijmegen, The Netherlands

bram.vanginneken@radboudumc.nl

radboudumc.nl

@radboudumc



In the long-term future, I think that computers will take over the work of image interpretation from humans, just as computers or machines have taken over so many tasks in our lives. The question is, how quickly will this happen?

Another question is, what is Artificial Intelligence (AI)? How does it work? Is it terribly complicated and difficult to understand? First we had artificial intelligence, then machine learning (ML), a subset of AI, became popular in the 1980s. Since 2010 deep learning (DL) in turn, a subset of machine learning, has become widespread. Classical AI is what we used until the 1980s. It's what

ruled most systems where humans tried to programme knowledge into the computer in order to let the machine react intelligently. It didn't work very effectively though, so, in the 1980's ML was more favoured. Here, machines actually began to learn from data, but the data was not images but rather numbers extracted from images. DL is unique in the sense that the computer learns everything directly from the images, so the involvement of humans in the process is much lower.

The question is, how can these computer applications be leveraged to improve different stages of the radiology workflow?

Integrating AI, ML and DL into Imaging

How can you incorporate AI, ML and DL into radiology? It's not just the algorithms; it's also the way they're integrated into processes.

Of course the traditional way of doing this is, AI place markers on suspicious lesions that merit a second look. This addresses the potential problem of an oversight in the case where a radiologist is tired and they miss something.

This system can give a large number of false-positives, but it can also be reassuring because, as a radiologist, you recognise there are always false-positives. This approach has the advantage that it can actually be useful even if the algorithm is not very good.

You can go further if you are distracted by all of these false-positives; some vendors don't show all the markers but they only appear when you click on the lesion. This is even easier to integrate into the workflow as you get a second opinion on a particular lesion and you get a score that you can take into account. However, the responsibility is still with you, the radiologist.

Scoring Whole Exams

There are also AI algorithms that can provide a score for an entire exam. A low-risk way is using this for triaging. The algorithm can sort your work list and prioritise the cases where AI thinks there is an abnormality that may be urgent.

Perhaps this is not so adaptable for screening but some radiology units are using this for reading

chest X-rays. A large number of radiology departments are overburdened as they have multiple chest X-rays to examine. If they read the most urgent ones first, then they can quickly contact the referring physician and get the patient treated.

Background AI Raising Alerts

There is the possibility of having AI running in the background and, if the radiologist reads the case as normal and the AI is more suspicious, it raises a flag and asks for another radiologist to look at that case. An advantage is it's unobtrusive. It might present some risk for overall diagnosis, but it is easy to integrate into the workflow.

You could also do it the other way round; if the radiologist thought a case needed special attention, you could let the AI look at it and maybe it, in some cases, would disagree with the need for a referral. This could be one way of reducing unnecessary work.

Reducing Double Reads and Costs

There's also the option of going one step further and actually letting the AI score every exam rather than send each one back to radiologists for a double reading. If the computer thinks the chance of cancer is very low, then you only do a single reading. This would lead directly to cost-savings.

A radiologist team could build on this, only do a single reading by humans, and let the AI produce a score, acting as a second reader. If there was non-consensus on the outcome, a radiologist would act as arbitrator between the opinions on the readings.

By the same token, there's the possibility of letting AI arbitrate to make the final decision. It would also be interesting then, if AI had access to the lesion that was marked by the human reader and could make the final decision, as the question would really be: 'Who would make the better arbitrator? The computer or the radiologist?'

Of course, now we are getting into more dangerous waters because AI would decide what to look at more closely so the computer could be the reason why something critical was missed. You could advance further with this paradigm and simply have a subset of exams that nobody looked at and the AI would select a number of exams that needed to be examined by human readers. Here of course the performance of AI has to be very efficient, but there's also another thing that is actually very important; that AI should not make a really terrible error, because this would probably not be accepted by society.

Selective Examination with AI

Another point that is very important in some settings (but probably not for plain mammography) is, if the exam was very large and going over the entire case was very time-consuming, that the computer could home in on areas that the radiologist needed to examine.

This is something we are already doing in automating lung screening with CT. Going through an entire CT scan is extremely time consuming. If we implemented lung cancer screening in Europe, we would not have enough radiologists to scroll down all the CT scans, so maybe you only need to look at the cases and the slices of potential nodules selected by the AI. This could also show a lot of potential for 3D ultrasound.

AI Autonomy and Ethics in Radiology

Finally, maybe autonomous AI will be the end goal. This scenario would offer the greatest cost-savings because there would be no need for humans anymore. However, in this case, there could be the issue of disastrous errors made by AI.

I think, in the end, it's more of a legal matter than a technical matter whether society wants to employ these kinds of algorithms. In fact, such systems already exist for diabetic eye screening that have been approved by the Food and Drug Administration. No doctor needs to look at the image; the AI decides who should go to see an ophthalmologist.

How Should We Use AI in Our Workflow?

In reality, there are many possibilities so, in the near future, what can we expect from AI and radiology?

I think within the next five years, AI will be introduced quite gently, in ways that will create minimal risks to workflow speed. This is important as, otherwise, the radiologist would not accept it for triage or background operations. I think radiologists would actually welcome AI if they used it and saw that it took over the repetitive aspects of their work and functioned successfully.

If you were to calculate how many tasks radiologists are doing, you would get a very long list. For many imaging areas, there are no AI systems yet.

But in the long term I am very positive because I think that AI will massively improve the health gap, especially where there is a lack of high quality healthcare. In a Western setting, I think AI will reduce costs significantly. At the end of the day, it is very important to keep healthcare affordable.

This article is based on a lecture Prof. Ginneken presented at EUSOBI 2019 in Budapest.

KEY POINTS



- AI could target different radiology modalities and workflows to make processes more efficient, reduce staff burnout and cut costs.
- The technology could be deployed in multiple ways such as in background monitoring or double reads.
- Society would not accept AI making serious errors.
- Many areas of radiology don't yet use any AI systems.
- Gentle introduction over next five years and visible success will make AI integration into radiology smoother.

Beyond Imaging, Towards a Care Pathway Approach Powered by AI



Giuseppe Recchi
CEO
Affidea

The healthcare industry is under transformation. An ageing population and the rise of noncommunicable diseases are driving an industry shift away from curing disease in the short term toward preventing and managing disease and promoting overall well-being in the long term. Across Europe, we see the same issues – underfunded and understaffed national health systems.

The Need for Earlier, Faster and More Accurate Diagnosis is Increasing

An estimated 75% of clinical decisions are based on a diagnostic test, raising the demand for access to quicker, more accurate diagnosis. Eurostat reported approximately 600,000 yearly deaths in Europe, avoidable if timely and effective detection and care provision had been provided. Chronic disease affects one-third of Europeans above the age of 15 and incidence is expected to rise. Furthermore, six in every 1,000 Europeans are diagnosed with cancer each year.¹

Healthcare is seeing a shift to out-of-hospital care – so hospital systems will continue to partner with outpatient service providers to efficiently

provide care during a patient’s entire journey to health, keeping them out of hospital, improving their health status and reducing costs for national health systems.

Healthcare Empowered by AI

Artificial intelligence, robotics, automation and advanced digital and cognitive therapies are expected to disrupt current healthcare delivery models.

The analysis of big data with AI techniques will have an enormous impact on disease prevention, care and treatment. By effectively integrating data and analytics across the care pathway, medical professionals and staff can be better supported with insights that enable them to bring predictive and personalised care. For example, AI powered software can provide more detailed insights, with more data points, invisible to the human eye. In cancer management, this can mean earlier detection allowing for potentially more favourable treatment outcome. Diagnostic imaging will expand its role in the broader healthcare spectrum with innovations allowing to avoid costly and invasive procedures.

Advancements in precision medicine and detection of disease will minimise overall treatment costs while improving treatment outcomes.

THE FUTURE OF HEALTHCARE IS ALREADY HERE. THE POTENTIAL TO MAKE AN IMPACT FOR PATIENTS AND DOCTORS IS TRULY EXCITING

However, these advancements won’t replace people with machines – it’s about creating a more accurate and more efficient patient pathway. In many European countries, pressure on health services is leading to shorter consultation times with less doctor-patient interactions. In Italy for example, the average GP consultation time is only around 10 minutes. AI will change the interaction between doctors and patients, speeding up the diagnostic processes, providing doctors with more granular data, allowing them to spend more time in discussion with patients.

We don’t see AI as a 'one-size-fits-all' solution, but rather a tool for a more personal doctor-patient experience, which in the end will enhance patient

satisfaction, provider productivity and overall quality of care. But this won't happen overnight.

At Affidea, We Have the Ambition to Lead the Healthcare Transformation

We're a digital healthcare company competing in today's world to solve tomorrow's challenges and we have the determination to shape our industry's future for the benefit of patients and doctors. We're committed to a care pathway approach, while embracing digital innovations. Although we're still on the journey, we've made great strides in revamping our strategy, portfolio of services and European footprint. It was a year of transformation, where we increased our focus in three strategic directions: expanding our footprint across Europe in the countries where we are present, enlarging our portfolio of outpatient care services and subspecialties and embedding AI in to our operations.

In the last 6 months, we added 34 new centers to our network, through acquisitions or greenfield, strengthening our position in advanced diagnostic imaging and adding new outpatient capabilities. The countries where we have expanded our presence this year are – Ireland, with the opening of three new ExpressCare centers, Italy with the acquisition of Mediocenter clinics and NSL, Lithuania where the company added MPG centres doubling its presence in the country, Spain where we added Manchon Group, a reputed DI provider in Catalonia region and the most recent one in Hungary, adding the private outpatient provider, MSB, located in the biggest shopping malls of Budapest.

Currently, we can say that we have a diversified business mix across advanced diagnostic imaging, lab diagnostics, teleradiology, outpatient and cancer care services.

We have established a network of sub-specialty expert radiologists in every country to collaborate across Europe. This network defines the best medical protocols, allowing for timely and high-quality diagnosis and faster and better treatment. We have developed 11 sub-specialty groups with representatives in all 16 countries, encompassing cardiac imaging, neurology, breast, musculoskeletal, GU/Prostate, GI/Abdominal, helping doctors with the right diagnosis tailored to the part of the body. By combining networked radiology and sub-specialty expertise, we can bring top specialist diagnostics to any location.

And we have launched two clinical products powered by AI. The first one - Affidea neuroInsight|MS, in partnership with icometrix, serves patients with multiple sclerosis and has been launched in 5 countries across our Group. Recently, we announced the launch of our second AI clinical product, Affidea breastInsight|Mammography, in partnership with ScreenPoint for the early detection of breast cancer.

And many more will join our portfolio of clinical products powered by AI. The scale of our operation gives us unique capabilities in the world of AI, benefitting from the rich data sets to drive forward innovations in patient care, in a GDPR and safe way for our patients - 14 million scans every year in our 273 centres, located in 16 countries across the continent.

The future of healthcare is already here. The potential to make an impact for patients and doctors is truly exciting. At Affidea, we are working with more than 9,400 passionate professionals, with one final goal in mind: better care, better patient experience.■

Affidea at a glance:

- Multinational healthcare provider, with presence in 273 centres across 16 countries in Europe, providing high quality affordable care for millions of patients every year
- Working with over 9,400 professionals, producing 14 million scans every year
- Affidea is the only healthcare operator in Europe to sit on the Imaging Advisory Board of IBM Watson Health and also on Microsoft Cloud's board
- 50% of the European winning centres awarded by the European Society of Radiology belong to Affidea



REFERENCES

1.OECD Health at a Glance: Europe 2018.

Multisociety AI Radiology Ethics Framework Announced

Summary: With AI moving into radiology at lightning speed, international imaging and informatics societies have worked together to produce a paper on ethics guidance.



The development of artificial intelligence (AI) in radiology has prompted leading radiological societies in AI technology to issue a statement on a new ethical framework.

The statement was authored by the European Society of Radiology (ESR), the American College of Radiology® (ACR), European Society of Medical Imaging Informatics (EuSoMII), Canadian Association of Radiologists (CAR), Radiological Society of North America (RSNA), American Association of Physicists

in Medicine (AAPM), and the Society for Imaging Informatics in Medicine (SIIM).

Published simultaneously in *Radiology*, the *Journal of the American College of Radiology*, the *Canadian Association of Radiologists Journal*, and *Insights into Imaging*, the statement took into account comments from patients, regulators, radiologists, legal experts and other stakeholders on AI use.

With artificial intelligence's fast-expanding use in radiology, there are growing concerns that the

lack of regulations or standards for deployment may cause more harm than good. Indeed, experts are of the opinion that reliance on AI-based intelligent and autonomous systems can increase the risk of systemic errors with high consequences.

The international multisociety statement emphasises that ethical use of AI in radiology should promote wellbeing and minimise harm, and that the benefits and challenges of using the technology should be shared amongst stakeholders while respecting human rights, including dignity and privacy.

A summary of this consensus statement has been published by J. Raymond Geis, MD, senior scientist at the American College of Radiology Data Science Institute, and co-authors. Since AI carries potential pitfalls and inherent biases that may impact patient safety, radiologists "have a moral obligation to consider the ethics of how we use and appreciate data, how we build and operate decision-making [AI] machines, and how we conduct ourselves as professionals," write Dr. Geis et al.

Ethics of Data

The ethics of data should promote trust in acquiring, managing, and assessing data. Collection and use of data for AI tool development must take into consideration informed consent, privacy and data

protection, as well as ownership and transparency of the data. While using the data will benefit patients, through improved diagnosis and treatment of diseases, a key challenge is how to thwart those who will attempt to unethically capitalise on data – which may harm patients or the common good.

In addition, bias may exist in the data set used to train and test AI algorithms. Gender, ethnic, social, environmental, or economic factors are common sources of bias, although radiology AI may also be biased by clinically confounding attributes such as comorbidities and by technical factors such as data set shift and covariate shift due to subtle differences in raw and postprocessed data that come from different scanning techniques. "What are the possible risks that might arise from biases in the data?" and "What steps have been taken to mitigate these biases?" are among questions about the ethics of data that AI implementers should be able to answer.

Ethics of Algorithms and Trained Models

Classification tasks are one area where radiology AI performs at its best. It is important to remember, however, that an AI tool is a computer programme "envisioned, built, and monitored by humans." Fairness and equality are concepts not attributed to AI; such insights can only be within the purview of humans. Thus, radiologists must be able to anticipate how rapidly changing AI models may perform incorrectly or be misused and protect against unethical outcomes, ideally before they occur.

Meanwhile, newer techniques such as automated machine learning mean creating AI models has become

relatively easier, thus fuelling fears that some naive or unprofessional actors may be encouraged to produce AI-based solutions for research and commercial purposes. There is also the growing threat of malicious attacks on AI tools and data, which increases risks of harm to patients. With these developments, there is all the more reason to extend existing ethical codes in medicine, statistics, and computer science to consider situations unique to radiology AI.

Ethics of Practice

AI tools are not doctors; their utility is meant to enhance doctors' ability to provide the best care for patients. To what degree can clinicians delegate the task of diagnosing medical conditions to intelligent or autonomous systems without exposing themselves to increased liability for malpractice if the system makes an error? This and other questions about AI-caused harm will arise with ever-increasing frequency as these tools become pervasive.

With radiology AI turning into a complex ecosystem of clinical care, conscientious ethical values will be essential in making decisions about when to use AI, define metrics to describe appropriate and responsible AI, and recognise and alert the community to unethical AI. In addition, AI developers ultimately need to be held to the same 'do no harm' standard as physicians.

Establishing codes of ethics and practice for radiology AI should start now, which will ensure the safety of patients and their data, according to Dr. Geis and co-authors. Such codes of conduct must be continually updated to keep pace with new ethical issues that will appear rapidly and regularly.

Importantly, an ethical framework will help radiologists with implementing AI tools to make best decisions and actions for patients. Radiologists will after all remain responsible for patient care.

To read the report, go to: <https://iii.hm/zpx>

KEY POINTS



- Now is the time for the international radiology community to devise codes of ethics and practice for AI.
- Ethical use of AI in radiology should promote well-being and reduce the risk of harm.
- Transparency in AI deployment in radiology is of critical importance to prevent bias and to ensure responsibility and accountability lies with humans.
- The responsibility for patient care should remain with radiologists who will need to develop skills for best outcomes in a new AI ecosystem.



REFERENCES

Geis JR et al. (2019) Ethics of Artificial Intelligence in Radiology: Summary of the Joint European and North American Multisociety Statement. Available from doi.org/10.1148/radiol.2019191586

Bridging the Radiologist Staffing Gap with New Training Initiative

Summary: Across the world, there is a workforce crisis impacting breast disease management that is partly attributed to a shortage of radiologists. In the UK, a new credentialling programme seeks to tackle this through training more clinicians to become breast treatment experts. A new three-year accreditation programme, launched by the Royal College of Radiologists (RCR) and Association of Breast Clinicians, will provide standardised, national training for physicians who want to become more 'holistic breast clinicians.' HealthManagement.org found out more from Vice President for Clinical Radiology at the RCR, Dr. Caroline Rubin, who says the credential has been developed in response to patient, population, professional, workforce and service needs



Caroline Rubin
Vice President for
Clinical Radiology
Royal College of Radiologists
London, UK

caroline_rubin@rcr.ac.uk

rcr.ac.uk/

@RCRadiologists

Describe the threat facing breast care units in the UK. Is it too late to address the shortage?

Expansion of the NHS Breast Screening Programme (NHSBSP), demographic change and a significant increase in symptomatic referrals are increasing demand on breast imaging services. This increased demand is being exacerbated by workforce shortages caused, in part, by a higher than average retirement rate across all disciplines practising in breast imaging. This is happening because the majority of the workforce entered the NHSBSP when it was established in the 1980s and are therefore now reaching retirement age.

Increasing complexity in technology, such as the addition of tomosynthesis and contrast-enhanced mammography, and the increase in the use of breast MRI and image-guided excisions, is also impacting on the demand being put on breast imaging services. This increase in complexity means a better, more accurate screening and symptomatic breast imaging service

is being provided, but it cannot be fully delivered without an increased workforce.

There are vacancies across the breast imaging workforce including assistant practitioners, mammographers, advanced practitioners and consultant mammographers as well as the breast clinician and breast radiological workforce - but we can help to address the situation.

The solution is to provide training at all levels, including the credentialled training for Breast Clinicians, to support the workforce requirements now and in the future.

How did the RCR and the Association of Breast Clinicians devise the course?

The credential is based on current training models for breast radiologists, advanced clinical practice in breast imaging and the previously accepted ad hoc training for breast clinicians via post graduate

masters modules.

Training in clinical examination will be delivered to equivalent standards as the current breast surgical and advanced practice nurse training and genetic risk training delivered under the auspices of genetics and moderate risk assessment clinics.

Given the level of expertise needed for breast care, it must have been a challenge to devise such training. How have you ensured that three years will be enough to cover the requirements of breast care?

The credential is specific to the diagnosis and management of breast diseases. As such it is limited in scope in comparison with radiology training, which encompasses the whole of imaging (with or without the inclusion of interventional work) with special interest training undertaken in the final two years of training.

The required capabilities should be readily achieved within three years and some will enter credentialled training with existing relevant skills and competencies.

How important is it to address the shortage of radiologists in the framework of the new training? What percentage of the three-year training will be allotted for imaging training?

Training in all aspects is blended across the three years. Clinical and assessment of genetic risk will be the focus of the first year, alongside basic imaging optimisation and evaluation.

Imaging forms the major focus of the final two years, with maintenance of – and building on – clinical and risk assessment skills.

Is there anything else you think could be done to mitigate the shortage of breast care professionals and radiologists in particular?

AI is being promoted as having the potential to deliver efficiencies in terms of active appointment management maximising capacity, as well as acting as a second reader in the future. However, there are currently no approved systems in routine clinical use in the UK and it is not known

how long it will be before they are accepted by the NHSBSP. Supporting the imaging workforce by providing one of the reads of breast screening mammograms or enhancing the quality of the symptomatic breast service by providing a second read of symptomatic mammograms, which is currently not available routinely, will hopefully improve outcomes, reduce the risk of screening mammograms being single-read and provide some support. However, it will fall far short of many of the touted high-impact expectations for AI, such as those featured in the Topol Review from early 2019.

Visit MEDICA 9D41 and RSNA Booth 1805

DRESS FOR SUCCESS

Introducing the World's First Barrier and Securement Dressing

Minimize cost and eliminate secondary cleaning procedures with UltraDrape™ from Parker Laboratories. UltraDrape is cost-efficient compared to the alternative use of sterile gels and covers, while its inventive design allows a no-touch, aseptic procedure.

UltraDrape... the first-of-its-kind, sterile barrier and securement dressing uniquely designed for UGPIV.



To learn more about UltraDrape visit parkerlabs.com/ultradrape



ULTRA DRAPE™
UGPIV Barrier and Securement

Patent www.parkerlabs.com/ultradrape.asp

ISO 13485:2003



Parker Laboratories, Inc.

The sound choice in patient care.™

973.276.950

parkerlabs.com

Cultivating Innovation Cultures in Healthcare

Summary: It should be the responsibility of leadership to promote a culture for innovation by questioning established cultures and liberating narrow mindsets.



Dimis Michaelides

Keynote Speaker, Consultant and Author in Leadership, Innovation and Creativity Nicosia, Cyprus

dimis@dimis.org

dimis.org

@dimistweet



It is a harder to come to grips with organisational culture as opposed to, say, strategy or structure. This is because culture is a set of shared values, beliefs and assumptions which strongly influence behaviours, norms and the ways people interact. It is trickier to measure and monitor culture than it is to define objectives and resources or map out processes and organisation charts. Culture, as many a failed change agenda will bear witness to, can place huge obstacles to innovation.

Culture is determined by context, legacy and leadership. Context, represents the external influences on culture and the realities of the environment in which an organisation is operating – sector, profession, country, competition, regulation, etc. Legacy is the history of the organisation and how it has been doing business in the past. Context and legacy are, therefore, givens. Which leaves leadership as the only factor which can look to the future and actively change culture.

Two very simple, real-world cases illustrate the need for leaders to take on change responsibilities.

Going Dutch in Healthcare

Earlier this year, The Economist (2019) published an interesting article focused on why Dutch hospitals have a significantly lower incidence of superbugs – antibiotic-resistant microbes and a number of dangerous viruses - than most other European countries.

This is simply because, in the Netherlands, health professionals wash their hands better. Washing hands is something all hospital staff are trained to do. But frequency and thoroughness vary a lot, and this is what makes the difference. To actually get hospital professionals to wash their hands better and more often, it is important to prioritise reducing infection and to share statistics of the hugely positive outcomes of such practice. Less easy is allocating more money to cleansing products and making staff accountable for hand cleanliness. The hardest part of all is getting senior specialists to accept that a junior nurse might be strictly monitoring their hygiene (a key to success in the Dutch case).

You might ask how innovative the idea of washing your hands more frequently is for health specialists. Innovation is not always 'the next big thing.' A product, a service, a strategy, a business model, a process or a work practice is innovative if it is new to the workplace and if it brings value.

We Can't Change, or Can We?

About five years ago, I spent a day with senior health professionals of the public sector of a European country. To start off, I got an unsolicited earful of why any kind of creative change was impossible because they did not have budgets for innovation. After four hours of imagining possible improvements at hospital level, they came up with a scheme that needed no budget, and would save a projected few million euros if implemented. They had simply figured out smarter ways of organising and allocating beds. They agreed this could be implemented in a few weeks and they set off to do it.

Why was the culture so stubborn, so negative and so resistant to change to begin with in this case? Why will other hospitals not rush to take on Dutch hygiene habits any time soon? The above examples show that seemingly small changes often encounter the barrier of human mindsets.

How then might leaders liberate those limiting thoughts which exist only in people's minds (the public sector case) and how might they take action to change habits so as to deliver new value (the Dutch case).

Leadership Tips for Developing a Culture for Innovation

Fortunately, we have many documented cases of good and fast culture change in organisations. To share new values, new beliefs and new assumptions and to engage in new behaviours is a responsibility best undertaken consciously and as a priority by an organisation's leaders. As usual, actions speak louder than words.

Tip #1

Promote New Ideas

This is both a top-down and a bottom-up responsibility. An innovative company loves new ideas. Innovation will thrive

only when everyone recognises that it is a key value. Leaders in the top team must continuously design new strategies and business models. All people must be expected to bring forth and implement new ideas in ways that are compatible with the new strategies. Leaders must create forums such as innovation teams and idea sessions and offer idea-time and incentives for value-adding ideas. Of course, leaders must also be enthusiastically receptive to novelties proposed by their team.

Tip #2

Promote Freedom at Work

Creative ideas can come from very restrictive circumstances but they truly thrive with more rather than less freedom. Leaders should shift from simple delegation to empowerment, inviting people to create their own jobs around agreed expected outcomes. They should promote open debate or new ideas. Everyone need not always agree with their boss.

Tip #3

Generate Engagement in the Organisation

Engagement is the unwritten contract between organisation and employee to help each other grow. People will more generously offer their creativity when the organisation offers good training and personal development opportunities and when leaders strive continuously to achieve and sustain high levels of trust.

Tip #4

Ensure Everyone Takes Risks

Innovation is practically impossible without risk, but this does not mean licensing recklessness. A zero-risk policy is vital under some circumstances, especially those where the failure can be very costly, but leaders would do well to recognise that most situations are not like this. Leaders

should carefully consider risks and accept, even encourage, mistakes and not let failure be career-limiting. Making risk-taking acceptable is an invitation for leaders and people to take responsibility for their actions as they try out new things and to truly learn from experience.

Tip #5

Cultivate a Propensity to Change

Change is not easy and organisational change is best implemented when there is plenty of willingness for change at a personal level. Begin with the leaders' real efforts to change themselves. Recognise that people have different propensities to change. But do take action to place people in situations of change. Do not comfort people with the thought that when a change happens it's all over. Make sure they realise there will be more and more change. That way, the culture of the organisation gets used to navigating new, as yet unexplored, territories. This is the essence of innovation.

To buy a copy of Dimis Michaelides' book, *The Art of Innovation – Integrating Creativity in Organizations*, hailed as "a must-read for 21st century CEOs," email: dimis@dimis.org

KEY POINTS



- An established culture can place huge obstacles on innovation.
- Innovation is any product, service, strategy or business model that brings added value to the workplace.
- Even small changes to a system can be vulnerable to human mindsets. It's important for leaders to liberate these limiting thoughts.
- To develop a culture for innovation, leaders must work to promote new ideas and freedom, generate engagement, encourage risk taking and cultivate a propensity to change



Annemiek Nooteboom

Medical Professions
Consultant
Nooteboom Consult
The Netherlands

info@nooteboomconsult.nl

nooteboomconsult.com

@annemieknooteboom

The Importance of Body Language

Summary: Medical Professions Consultant, Annemiek Nooteboom, discusses how subtle changes in your body language can have a profound effect on interactions with healthcare colleagues throughout your career.

What are the benefits of approachable leadership and what impact can this have on the hospital system?

Approachable leadership is very effective because it will strengthen the bond with your staff and also effortlessly bring you the information you need to lead your organisation. When the professionals on the work floor feel that they can approach their leader at any time, patient safety and also the educational and team climate will improve.

How important is learning appropriate body language in the soft skills set?

It is important because a lot of professionals are unaware of the effect of their own body language, which is a missed opportunity because body language has such a great impact within a fraction of a second. It is the fastest, cheapest, most effective – or most ineffective – way to communicate with your surroundings. Once you know how to use your body language, it is much easier to connect with the people around you.

How does body language play a part in how new and more seasoned clinicians are perceived by other healthcare professionals?

Many young and relatively inexperienced doctors have a reflex to make themselves invisible because they feel insecure or insufficient. This makes sense

because, as humans, we instinctively tend to withdraw in on ourselves when we are exposed to a lot of new and unknown stimuli. For example, when you enter an ICU for the first time, there are lots of new sounds, machines, complex patients and you will be surrounded by many experienced nurses and clinicians. This might be overwhelming for a while, which causes most junior professionals to retreat and this is visible on the outside through their body language.

"A LOT OF PROFESSIONALS ARE UNAWARE OF THE EFFECT OF THEIR OWN BODY LANGUAGE"

It is important to resist the urge to do this because it might negatively impact the amount of contact you have with other professionals and will slow your learning curve. It is better to display confident body language right from the start. You can behave more confidently by standing firmly, taking up more space physically and speaking with a clear and sometimes even loud voice. By implementing these actions, you will instantly feel more secure on the inside.

For experienced clinicians, it is the other way around. They often are unaware of how much they are admired, and sometimes feared, by their subordinates. They don't realise that other professionals will not dare to ask them a question or tell them if they have a doubt.

In this case, it's important to display more open body language, making it easier for juniors to approach senior staff members.

Can inefficient body language impact a clinician's career and if so how significant can this be?

Nowadays, it is common practice for medical professionals to be evaluated through 360-feedback. In their report, they can read comments about their educational qualities and they can learn how they are perceived by residents, nurses and interns. Sometimes I am asked to coach doctors that have gotten less positive feedback. When I observe them, it often strikes me that they are actually not bad educators or bad people, but they have something about them which is intimidating, scary, angry, grumpy or arrogant. This behaviour doesn't always represent the person's character. In many cases, it has become a habit or adopted attitude but can have a major impact on their relationships with colleagues.

When you seem closed off and colleagues think "he/she doesn't want to talk to me" or, "thinks I'm inferior" or "they're always busy," a psychological barrier is created. This barrier doesn't easily disappear because people find it very hard to give spontaneous feedback until they are obligated to create a written report. We don't have the habit of telling each other "what you just said made me feel like I've done something completely wrong" or "you shouting at

me in the OR stresses me out” or “you make me feel like I’m not a good nurse.” This whole dynamic can create a lot of miscommunication. The professionals who seem less closed off can create an open channel of communication between them and their colleagues, creating fewer conflicts and frustrations.

What changes can clinician leaders make to become more approachable to junior staff members, both in general and through body language, and what is the significance of implementing these actions?

I would recommend for clinician leaders to take half an hour per day or a couple of hours per week to walk around, greet everyone and engage in some informal talk. When you establish an informal space at unbothered moments with your staff, they will find it much easier to tell you difficult issues at critical moments.

Professionals on the work floor have essential knowledge about successful and unsuccessful patient care processes. They also know about the interactions and ongoing quarrels between colleagues that a leader has no clue about. There are a lot of interesting dynamics taking place on the work floor and it is easier to lead your department when you are aware of everything that goes on.

I often recommend clinicians with a formal leadership position to let themselves be addressed informally, for example, you can have yourself be called by your first name instead of your full academic title. As senior staff members are already overly admired, and sometimes feared, this change does not impact the way people respect these leaders. This might seem like a small change but it has an immensely positive effect by lowering the threshold for staff to talk to you.

In terms of body language for leaders, it is important to display a relaxed, non-authoritarian attitude. If you tend to take up a lot of space with your body, hands, gestures and your voice is loud, you will seem authoritarian and dominant. Many leaders are good speakers and they ‘transmit’ all the time, they don’t listen enough. When you sit back and switch from transmitting to receiving – listening, observing and start to absorb everything that’s going on – you will receive significantly more information without much effort.

How can new physicians change their body language to establish themselves within the hospital system?

This is exactly the opposite of what senior leaders should do. New physicians should make themselves bigger, literally. Taking up more space with your body is really easy to do. For example, putting an arm on an armrest and not putting your arms in front of your body all the time.

"ONCE YOU KNOW HOW TO USE YOUR BODY LANGUAGE, IT IS MUCH EASIER TO CONNECT WITH THE PEOPLE AROUND YOU"

As a young physician, you can position your body in a way that looks comfortable and confident. For example, put your legs hip-wide apart and increase the space between your arms and your body. I have seen immediate effects after initiating these strategies with a lot of young interns and residents.

Also, when you are walking or doing rounds, it is important that you don’t stand at the periphery, put yourself

in the middle of the conversation. Everyone should be involved in the discussions and make eye contact with each other while standing in a big circle. During rounds, it is common for the fellow and supervisor to be doing all the talking while nurses, interns and residents listen without participation. The seniors should try to include every professional around the bed, including the patient, and the junior should put themselves in a position where the senior can look into his/her eyes.

What advice would you give to clinicians starting their healthcare career?

First is, realise that you are not the only one to feel insecure, almost every young doctor experiences this feeling, which is only natural when you are surrounded by all these experienced people. The difficult thing is that nobody in the hospital talks about it, so everyone thinks they’re the only one feeling inadequate. The second piece of advice is to talk to each other. You will soon discover that many young clinicians feel the same. If you experience a lot of anxiety, speaking to a coach can help. Thirdly, use all you have at your disposal, including your body through body language, your face with all its possible expressions and your voice.

For more information, lectures and training programmes, you can contact Annemiek at info@nooteboomconsult.nl or visit nooteboomconsult.com.



Christian Norris

Head Economist
PA Consulting
London, UK

Christian.Norris@
paconsulting.com

@PA_Consulting



Harry Dunsford

Economist
PA Consulting
London, UK

Harry.Dunsford@
paconsulting.com

paconsulting.com/healthcare

@PA_Consulting

Measuring the Nation's Health

Summary: A new health index proposed by the UK Government may be an effective way of collecting and acting upon abundant health data. It could also facilitate funding allocation to the most efficient initiatives, if devised and applied properly.

As a nation, we do not lack health statistics. We collect hundreds of figures, from simple mortality statistics to complex indices of health deprivation. The problem with having so many measures is that the public does not know where to focus and this undermines accountability.

The UK Government's Prevention Green Paper sets out plans to address this through a new health index, which would operate in the same way as the GDP figures do for the economy, and deliver a single indicator of the nation's health. This could provide a useful focal point to hold the government and the health and care system to account, and to generate debate about trends, improvements and priorities locally and nationally. However, for this to work the index will need to be designed and used carefully to avoid being another redundant measure that is just implemented, but not well understood or acted upon.

The challenge of designing an indicator, which is meaningful and captures the complexity of our lives, should not be underestimated. It would need to reflect the impact of the food we eat, the exercise we take, the air we breathe and the conditions we live in. At the same time, it would need to recognise that health is not just about how long we live, but also how healthy we are during our lives, both physically and mentally. To be a useful driver of debate and policy, the new measure will need to capture all these different dynamics, which will require sophisticated data collection and analysis.

Another challenge will be getting the timescale right. The aim of creating a health measure that receives the same level of attention as GDP is a worthwhile ambition, but it also needs to reflect that the pace of change in the nation's health is much slower than in economic activity. Quarterly GDP figures receive significant attention; two quarters of negative growth are used as the definition of a recession, but half-a-year's figures in a health index are unlikely to provide reliable indications of developments in the state of our health. Thus, while it will be important that the index picks up on any immediate changes, it needs to be constructed in a way that provides information about longer-term trends. The index will therefore need to develop a way of weighting different measures so that there is an appropriate balance between shorter-term data and indicators of slower-moving developments.

"THE NEW INDEX COULD BE A WAY OF CAPTURING A WIDER SET OF MEASURES OF HEALTH INEQUALITIES AND THEN DIRECTING FUNDING MORE PRECISELY"

Of course, an index is not an end in itself; it needs to be a driver of policy and of funding. This is particularly important in meeting the aims of the Prevention Green Paper. There will need to be some

mechanism to use the data revealed by the index to drive money to initiatives that will really make the difference in tackling health problems.

A significant share of more than £70bn NHS commissioning budget is distributed across the country among clinical commissioning groups based on relative mortality rates. However, this does not provide a full picture of the health challenges commissioners face in particular areas. The new index could be a way of capturing a wider set of measures of health inequalities and then directing funding more precisely to the areas where it can make the biggest difference. Alternatively, a separate fund could be established specifically for preventative activities, with money allocated on the basis of the index. However, it will be important not to undermine the flexibility of health commissioners to deploy funds in response to local needs.

Measuring the nation's health is the right aspiration, particularly given the indications that the growth in life expectancy is slowing down and the gap between the health of the richest and the poorest is widening. Equally, in a system where money will remain tight it will be ever more important that funding is spent effectively. Good data can make this happen, but getting the right measures and creating a responsive culture will not be straightforward

KEY POINTS



- Abundance of health measures creates the lack of focus for the public and undermines accountability.
- The government aims to address this issue through its Prevention Green Paper, suggesting a new health index.
- The index should take into consideration various indicators and properly reflect the pace of change in the nation's health.
- The data revealed by the index should drive money to the most efficient initiatives.
- The flexibility of health commissioners to deploy funds locally should not be compromised.

Advancing Our Health: Prevention in the 2020s

The Cabinet Office and Department of Health and Social Care published their Prevention Green Paper, Advancing our health: prevention in the 2020s, on 22 July 2019 (consultations closed on 14 October 2019). It sets out plans to tackle the causes of preventable ill health in England, by:

- Embedding genomics in routine healthcare and making the UK the home of the genomic revolution.

- Reviewing the NHS Health Check and setting out a bold future vision for NHS screening; and
- Launching phase 1 of a Predictive Prevention work programme from Public Health England (PHE).

Full text available from gov.uk/government/consultations/advancing-our-health-prevention-in-the-2020s.

STILL USING CDs?

Burning CDs to deliver image studies to patients is becoming **obsolete** and **costly**.

Having a **patient portal** but still burning CDs?



DISCOVER



MAGIC LINK

Idonia provides a **secure** bridge between medical centers and patients by simplifying access to medical reports and images.

1.2 MILLION
images delivered

>300k€
savings



 sales@idonia.com

Resilience: The Airbag for Nurses and Other Healthcare Professions

Summary: Instilling an attitude of resilience in healthcare staff allows them to meet their challenges and effectively recover from setbacks.



Iris Meyenburg-Altward

Managing Director of Nursing
Director of the Academy for
Nursing Education & Training
Medical University Hannover
Hannover, Germany
President
European Nurse Directors
Association (ENDA)
Germany

Meyenburg-Altward,
Iris@MH-Hannover.de

www.mh-hannover.de

Every healthcare provider has to face a number of stresses and difficult situations when providing daily care for patients. This puts members of the healthcare profession at risk of anxiety, depression, stress-related illnesses and even burnout.

Nurses especially are prone to these disorders as nursing comes with plenty of unique stresses and high-pressure situations. Therefore, resilience training and coping mechanisms are considered vital for managing a work-life balance, especially for those who are responsible for delivering medical care.

Resilience is the capacity to accurately perceive and respond well to stressful situations. It is demonstrated not only in times of crisis, but every day, by showing up and doing our jobs. With the uncertainty, transition and reorganisation associated with healthcare, resilience is more important than ever, if today's nurses are going to thrive.

Resilience – What Does It Mean?

The origin of the concept of resilience comes from the study of materials and means the ability of a material, after changing its form, to return to its original form. In the scope of healthcare, Masten and Obradovic (2006) stated that resilience could be defined as being related to every type of word which is a positive component of the process for adapting to difficulties.

The U.S. Department of Health and Human Services (2015) defines individual resilience as the ability to withstand, adapt to and recover from adversity and stress. In other words, resilience can manifest as maintaining or returning to one's original state of mental health or well-being, or reaching a more mature and well-developed state of mental health or well-being, through the use of effective coping strategies.

Significance of Resilience

To take care of people with HIV/AIDS, vulnerable children and people who are terminally ill, or to work in emergencies, Oncology or Burn Units might be depressive, especially for nurses who have close and continuous contact while working. These depressive factors can cause physical and mental problems, such as fatigue, lack of concentration, emotional exhaustion and burnout.

Negative stress-related causes have an impact not only on nurses' wellness, but also on their caregiving ability to patients and the general working outcome. Therefore, resilience is a source — an 'airbag' to physical and mental well-being. The study by Manzano Garcia and Ayala Calvo (2012) revealed that resilience is an important protective factor against emotional exhaustion. Furthermore, a source defines resilience as a supportive factor that

helps nurses to adapt to their profession's difficult physical, mental and emotional nature.

A study integrated a Stress Management and Resiliency Training (SMART) programme into the usual orientation programme, which is conducted for new nurses, nurses who switched to a different service or nurses who have a new role in the establishment. At the end of this study, the SMART programme was found to be effective for improving resilience of nurses (Chesak et al. 2015). Mealer et al. (2014) conducted a 12-week training programme for intensive care nurses (HealthLeaders 2018). After the programme, it was observed that there was a significant decrease in post-traumatic stress disorder levels of nurses.

Components of Resilience

There is no single accepted set of components of resilience, but this set of characteristics and contributing factors can provide a useful guide and form a good basis for understanding the nature and scope of resilience (Figure 1).

Salutogenesis – A Similar Concept

Salutogenesis (becoming healthy) is a resilience model based on the medical sociologist Aaron Antonovsky (1923–1994) that emphasises cognitive coping strategies to avert health risks. Antonovsky

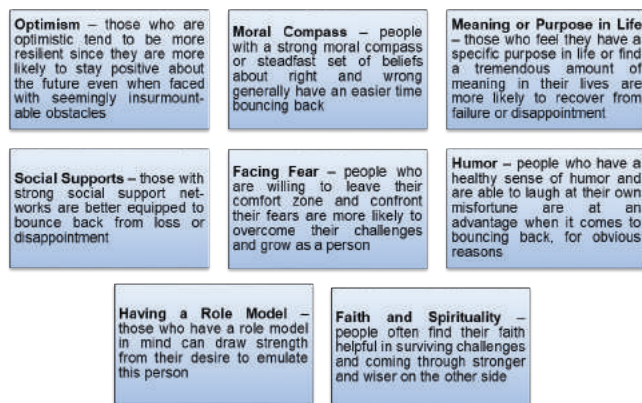


Figure 1. Set of Components of Resilience

asked “What is the genesis of health?” and not just “What is the genesis of illness?”

The basic assumption of the model is the sense of coherence (SOC) from Antonovsky (1993) as a ‘global orientation’ and SOC is a mixture of optimism combined with a sense of control, which is made up of the following components:

- Comprehensibility (ability to analyse the situation regarding its causes).
- Manageability (knowledge of one's own resources); and
- Meaningfulness (meaningfulness of an attempt at coping).

The Good News

The SOC in salutogenesis is either inborn or acquired early in childhood, but resilience is learnable and exists in the social surroundings. It can be strengthened and further

developed lifelong. Coping refers to the personal approach to stressful situations. Resilience does not emanate from the individual person, but asks, first and foremost, about the environmental conditions necessary for the occurrence of a successful ability to resist.

There are three resilience models that essentially describe the same mechanisms for the impact of stress on quality adaptation, which include:

Compensatory Model

This model sees resilience as a factor that neutralises exposures to risk. Risk factors and compensatory factors independently contribute to the prediction outcome. In Werner and Smith's study (2001), four central characteristics emerged for the young adults labelled resilient: an active approach toward problem-solving; a tendency to perceive experiences in a positive light even when they were suffering; the ability to gain other people's positive attention; and a strong reliance on faith to maintain a positive life view.

Challenge Model

It suggests that a risk factor, provided it is not too extreme, can actually enhance a person's adaptation. In essence, the experience prepares the individual for the next challenge (O'Leary 1998).

The Protective Factor of Immunity versus Vulnerability Model

This model of resilience is derived from developmental literature and systems theory. It indicates that these protective factors foster positive outcomes and healthy personality characteristics despite unfavourable or aversive

life circumstances (Bonanno 2004). The protective factors identified included emotional management skills, intra-personal reflective skills, academic and job skills, ability to restore self-esteem, planning skills, life skills and problem-solving skills (Ungar 2008).

Leadership Strategies for Building Nurse's Resilience

There are four strategies for building nurse resilience, which consistently emerged:

- Formal education programmes
- Social support
- Meaningful recognition; and
- Milieu design.

There are different ways to approach improvement in nurses' resilience. These depend on the current stage of perceived culture of the working environment. They also need the full commitment and credibility from above.

Hart, Brannan and De Chesnay (2014) recommend the following approaches:

- Practice environment assessment
- Shared governance
- Mentorship programmes
- Graduate nurse residency programmes
- Formal and informal debriefing after a stressful event
- A zero-tolerance policy for lateral violence; and
- Incentives for personal wellness.



Figure 2. Examples of Encouragement of Resilience for Nurses at the MHH (Source: mh-hannover.de/pflege_in_der_mhh.html).

Practical Examples

In recent years, there have been constant developments in the encouragement of resilience for nurses at the Medical University Hannover (MHH) Nursing Department (Figure 2).

Milieu Design

Some examples of the implementation of milieu design strategies are: structuring a day around work tasks, community meetings and skills training groups; ensuring that the physical environment is comfortable, inviting and clean; and planning of a recreational event that will

encourage high levels of participation and interaction between people. Each of these tasks helps to shape the environment in order to make it conducive to achieving the goals of the individuals receiving services.

In Short

Resilient employees are simply better employees, on average. They meet their challenges in different ways, develop and maintain better buffers against stress and anxiety, and more effectively recover from the setbacks that everyone experiences from time to time

KEY POINTS



- Resilience is the capacity to accurately perceive and respond well to stressful situations.
- Stress-related incidents can impact nurses' wellness and their ability to give quality care.
- Salutogenesis is a resilience model that emphasises cognitive coping strategies to minimise health risks.
- Formal education programmes, social support, meaningful recognition and milieu design can be used to build nurse resilience



REFERENCES

Antonovsky A (1993) The structure and properties of the sense of coherence scale. *Social Science & Medicine*, 36(6): 725-733.

Bonanno GA (2004) Loss, trauma, and human resilience. *American Psychologist*, 59(1): 20-28.

Chesak SS, Bhagra A, Schroeder DR et al. (2015) Enhancing resilience among new nurses: feasibility and efficacy of a pilot intervention. *Ochsner Journal*, 15(1): 38-44.

Hart PL, Brannan JD, De Chesnay M (2014) Resilience in nurses: an integrative review. *Journal of Nursing Management*, 22(6): 720-734.

HealthLeaders (2018) Creating Nurse Resilience Programs That Work. Available from healthleadersmedia.com/nursing/creating-nurse-resilience-programs-work

Manzano Garcia G, Ayala Calvo JC (2012) Emotional exhaustion of nursing staff: influence of emotional annoyance and resilience. *International Nursing Review*, 59(1): 101-107.

Masten AS, Obradovic J (2006) Competence and resilience in development. *Annals of the New York Academy of Sciences*, 1094: 13-27.

Mealer M, Conrad D, Evans J et al. (2014) Feasibility and acceptability of a resilience training program for intensive care unit nurses. *American Journal of Critical Care*, 23(6): e97-105.

O'Leary VE (1998) Strength in the face of adversity: Individual and social thriving. *Journal of Social Issues*, 54(2): 425-446.

Ungar M (2008) Resilience across Cultures. *The British Journal of Social Work*, 38(2): 218-235.

U.S. Department of Health and Human Services (2015) Individual Resilience. Available from phe.gov/Preparedness/planning/abc/Pages/individual-resilience.aspx

Werner EE, Smith RS (2001) *Journeys from Childhood to Midlife: Risk, Resilience, and Recovery*. New York: Cornell University Press.



Patient Safety
MOVEMENT

8TH ANNUAL

World Patient Safety, Science & Technology Summit

Save the Date!

March 5-7, 2020

Keynote Speakers



Marc Gheeraert
CEO European Society of
Anesthesiology



Peter Lachman, MD,
MPH, MBBCH, FRCPC, FCP (SA), FRCPI
Chief Executive Officer of
The International Society for
Quality in Health Care



Carole Hemmelgarn,
MS, MS
Patient Advocate

The Waterfront Beach Resort,
Huntington Beach, California

Learn More at
patient.sm/summit-2020

Featured Panelists



Mary Dale Peterson, MD,
MSHCA, FACHE, FASA
President-Elect, American Society
of Anesthesiologists



Rt. Hon. Jeremy
Hunt, MP
Former Secretary of State
for Health and Social Care,
Department of Health and
Social Care, United Kingdom



Raj Ratwani, PhD
Director, MedStar Health's National
Center for Human Factors in
Healthcare; Associate Professor,
Georgetown University's School
of Medicine

Founder:



Benefactor:



Co-Conveners:



#PLAN4ZERO #WPSSTS

© 2019 Patient Safety Movement Foundation.
All rights reserved.



Robert S. Kaplan

Senior Fellow
Marvin Bower
Professor of Leadership
Development, Emeritus
Harvard Business School
Boston, USA

rkaplan@hbs.edu

hbs.edu



Michael E. Porter

Bishop William Lawrence
University Professor
Harvard Business School
Boston, USA

mporter@hbs.edu

hbs.edu

@MichaelEPorter

Measuring Healthcare Outcomes to Deliver Value and Lower Costs

Summary: A new initiative, called ACS THRIVE (Transforming Healthcare Resources to Increase Value and Efficiency), was launched this summer to help hospitals and surgical practices improve patient outcomes while lowering the cost of delivering care. A collaboration between the American College of Surgeons (ACS) and Harvard Business School's (HBS) Institute for Strategy and Competitiveness aims to improve healthcare value. ACS THRIVE expects to conduct pilot projects for three conditions at five sites per condition. HBS professors and leading Value-Based Care proponents, Robert Kaplan and Michael Porter, spoke to HealthManagement.org about the value of the project for managing costs in healthcare.

On both a micro and macro level, why is the practice of measuring outcomes so beneficial to healthcare?

Outcomes measurement enables healthcare organisations to perform five essential functions:

Learn and Improve

Measuring patient outcomes is the single most important driver for learning how to improve the care we deliver to patients. For example, Martini Klinik in Hamburg, the highest volume provider for prostate cancer in the world, has been measuring clinical and patient-reported outcomes for every patient since the clinic's founding in 1992 (Porter et al. 2014). The clinic holds semi-annual meetings to analyse risk-adjusted and physician-specific outcomes, and to identify the best practices, as well as opportunities for specialised coaching and training. The continual focus on how to improve outcomes has enabled

Martini Klinik to achieve urinary, bowel, and potency complication rates that are 75% below the German average. This is just one example of the power and benefits from measuring outcomes important to patients.

Optimise Care

As clinical teams experiment with different treatment methods, care pathways, personnel teams, diagnostic tests, drugs, and devices, their success must be measured by their results on outcomes that matter to patients, such as erectile and urinary functioning after prostate surgery. Clearly defined outcome metrics enable providers to assess the consequences from their treatments on the most important issues to their patients. Evidence-based care can be built on a patient-centred premise of outcomes, not just on results easiest to measure.

Shared Decision-Making

Measuring and reporting of patient outcomes is an essential underpinning of truly informed and shared decision-making. Without accurate information on the outcomes and risks associated with a treatment, patients are ill-informed and less able to fully understand the consequences of their decisions. The consequences include not only the range of possible adverse events associated with their treatments but also information about the likelihood of alleviating their pain and discomfort and ability to resume activities of normal life, dimensions that truly matter to them.

Public Accountability

Patients, their families, employers, policy makers, regulators, and society are entitled to information on the specific outcomes that each healthcare provider achieves.

Currently, large variations in patient outcomes are invisible not only to the treating clinicians but also to those receiving and paying for the treatment.

Contracting

Migrating to value-based payment models, such as bundled payments, requires that payments be linked to outcomes achieved. Fee-for-service (FFS) payments, in contrast, are made independently of outcomes achieved. In fact, FFS rewards poor outcomes as hospitals get paid more for certain types of readmissions and both physicians and hospitals can get “paid again” for revision treatments.

What are the surgical conditions in focus during the trial?

The current leading contenders are colon cancer, breast cancer, and morbid obesity/bariatric surgery. Once we finalise the sites and conditions, we hope to begin reporting results within six months, and, certainly, one year.

At present, where do you think the most inefficiency and waste lie in the surgical ‘care continuum’?

A big source of improvement comes from each site gaining better knowledge of its outcomes and costs. This enables the site to eliminate duplicative or non-value-added tasks, downshift some tasks to lower-skilled employees when medically appropriate, and optimise care across the entire treatment cycle, rather than optimising each individual isolated step in the care cycle. Part of the optimisation is having multi-disciplinary teams treat the condition so that patients can benefit from the team’s use of behavioural and social service experts to address the social determinants of health, such as housing, at-home support, and financial security, that have been shown to affect a patient’s health and recovery. We are confident that, despite having more personnel involved in the treatment, we will enjoy

lower total costs, when properly measured, as well as better outcomes for patients.

Additional opportunities will arise from identifying and transferring best practices among the sites. We don’t have a particular cost-cutting target in mind, but my personal belief is that we can lower per-treatment costs by at least 10% and likely 20% while also improving patient outcomes. This is a personal, not an ACS THRIVE target for success at this point. It’s important to note I’m referring to costs of the resources (eg personnel, equipment, space, supplies and devices) used to treat the patient, measured via time-driven activity-based costing as opposed to the charges or prices paid for the treatment.

How will the project address any current inefficiency?

Today, hospitals and clinicians do not know the actual costs for treating patients across the care cycle. This leads to lots of inefficiencies, such as using overly-skilled personnel to perform routine tasks, performing duplicative or redundant tasks, and not thinking about the opportunities to spend somewhat more by engaging better with patients prior to and after surgery, including behavioural and social service support, that will lead to high cost avoidance downstream from the surgery. Time-driven ABC will make such cost-saving opportunities highly visible, leading to order-of-magnitude reductions in complications, patient non-compliance, readmissions, and rehabilitation costs.

Can you explain a little about the features of THRIVE which will make it scalable across a wide array of healthcare facilities?

ACS has demonstrated, with its verification programmes and ACS NSQIP® (National Surgery Quality Improvement Programmes) surgical outcomes measurement programme, that it can scale measurement innovations across the hundreds and thousands of hospitals where its membership practices. ACS THRIVE plans

to leverage this great capability to disseminate capabilities for best practice measurement of cost and outcomes.

Do you think some of the pilot findings could be applied to healthcare areas outside surgery or is it tailored to the surgical space?

We will, given the partnership between ACS and HBS, naturally be focused on conditions requiring surgical intervention. But what we learn about how to measure costs accurately across entire care cycles and how to measure condition-specific outcomes that matter to patients will be highly transferable to conditions that do not involve surgery.

What will be the legacy of THRIVE?

Around the world, healthcare costs are rising, patients aren’t achieving the outcomes they desire, and providers are frustrated with increasing administrative burdens and shrinking reimbursements. We believe we can achieve a health system that is more efficient, more patient-centric and delivers better care at a lower cost to society. Simply cutting salaries, reducing headcount, limiting access to innovative drugs and devices, or reducing reimbursements is not the answer. Instead, we need to rethink the care cycle, establish clear processes to track costs and measure both clinically important outcomes and those outcomes important to the patient. This is the only optimistic path we have for reforming the healthcare system in ways that make every stakeholder better off.



REFERENCES

Porter M et al. (2014) Martini Klinik: Prostate Cancer Care. Available from hbs.edu/faculty/pages/item.aspx?num=46332

Revenue Cycle Management

Summary: With the push to do more with less in healthcare, a majority of provider organisations are working with at least one firm to outsource some revenue cycle processes.



Boyd Stewart

Vice President of Revenue
Cycle Research
KLAS Research
Orem, Utah
USA

boyd.stewart@klas-
research.com

klasresearch.com/home

@KLASresearch

A couple of years ago, I attended a revenue cycle leadership conference with about 300 attendees. Our hosts realised that we wouldn't be able to cover every topic on the docket, so they let the attendees decide which topic on the list they wanted to discuss first. The list had so many market buzzwords that I couldn't wait to hear which topic would be the favourite.

Imagine my surprise when bundled payments got only three votes! Activity-based costing and patient payments were brushed off as well. Then we got to authorisations and denials, and almost every hand in the room went up.

The CFO seated next to me noticed my bewilderment. "I want to discuss everything on the list," he said, "but we can't jump to Revenue Cycle 201 when Revenue Cycle 101 is still bogging us down."

This experience was a sobering reminder of the problems that revenue cycle leaders face on a day-to-day basis. Their side of the hospital is both blessed and cursed, with many key performance indicators (KPIs), and today's push toward value-based care pressuring health systems to do more with less.

In the past, a health system with revenue cycle problems could try hiring additional staff members. Today, the push toward efficiency has forced many health systems to limit their head counts. As if that weren't enough, ever-shifting government regulations

and payer requirements are causing plenty of migraines as well.

But provider organisations don't give up easily. Many of them are turning to the option of outsourcing parts of their revenue cycle, such as ageing accounts, revenue integrity, underpayments, and/or eligibility enrolment. These provider organisations are hopeful that their revenue cycle will perk up if it's nourished with additional resources, attention, and technology.

The Growing Revenue Cycle Outsourcing Market

Some health systems are choosing the revenue cycle outsourcing (RCO) route by outsourcing their complete business office (and usually the patient access department and health information management department). Other providers prefer extended business office services (EBOS), which involve the outsourcing of one or more of the business office (third-party collections, early out self-pay, etc). Both options are growing in popularity. In fact, most health systems in the U.S. work with at least one EBOS firm.

The trend towards outsourcing seems unlikely to fade anytime soon. Fortune Business Insights recently published a report (2019) that lists a few reasons for this and also forecasts the growth of the complete RCM outsourcing market through the year 2026. One press release about the report states:

"The rise in patient population and increasing demand for medical aid are helping the global revenue cycle management outsourcing market in North America to emerge dominant. Other factors contributing to the growth of the market in this region [include the] reduction in unnecessary medical costs, limitations on traditional financial processes, and advancement in cloud-based solutions.

"Asia Pacific and Europe . . . are expected to exhibit [the] fastest growth rate on account of emerging healthcare infrastructure, better medical tools, advanced technological approaches and emerging research centres" (Fortune Business Insights 2019).

An outsider, upon hearing about these trends, might assume that the typical experience with revenue cycle outsourcing is overwhelmingly positive. The reality is not that simple.

Buyer's Remorse?

KLAS recently published our Outsourced Revenue Cycle Services 2019 report (klasresearch.com/report/outsourced-revenue-cycle-services-2019/1467), which includes perspectives from full-outsourcing and partial-outsourcing customers. On one hand, providers using RCO point solutions (including revenue integrity, underpayment solutions, eligibility services, and EBOS engagements) have very low levels of buyer's remorse. However, 33% of the surveyed customers outsourcing

their entire revenue cycle said that they would not purchase their firm's RCO services again (Smart and Zeitner 2019). The customers' answers depended heavily on the firm in use; there are high performers and low performers in the market.

What causes these health systems to be disappointed in their RCO engagements? In speaking at length with the providers polled for the 2019 report, KLAS found that most grievances fell into two main categories:

"WHETHER YOUR ORGANISATION IS ALREADY ON THE OUTSOURCING ROUTE, CONTEMPLATING IT, OR FEELING FORCED IN THAT DIRECTION, KNOW THAT YOU CAN HAVE A SUCCESSFUL ENGAGEMENT"

- **Limited or delayed tangible outcomes.**

Every day, a dysfunctional revenue cycle wastes money and decreases patient satisfaction, so health systems that don't quickly see results—or at least positive trends towards their goals—often cry foul. Some health systems feel that they could do better than their firms do. The situation is much like a painter paying another painter to paint his house; RCO firms are often held to a very high standard.

- **Poorly aligned goals.**

Some health systems engage with a firm, but feel that the health system still isn't meeting their key goals, even when they see their firm pushing hard to hit the firm's established metrics. It's difficult to reach mutual satisfaction when each party defines success differently.

Creating a Positive Outsourcing Experience

While too many healthcare leaders are currently unsatisfied with the firms taking on work for the entire revenue cycle, the majority of customers that KLAS interviewed were pleased overall. Many health systems have gleaned financial and other gains through outsourcing at least certain processes from the revenue cycle.

Is your organisation currently outsourcing any of your revenue cycle? If not, it might be worth considering. Some people in the revenue cycle field assert that an organisation would probably benefit from outsourcing if its underperforming KPIs include bad debt, charity, cash-to-net revenue, credit balance A/R, billing turnaround, and the percentage of claims paid on the first pass (Lagasse 2018).

Granted, there are many factors to consider besides the question of whether your organisation could improve a few of your KPIs. Some health systems are dealing with acquisitions or other complicated circumstances; they may feel they have to outsource in order to keep up with competitors or even stay in business at all.

Whether your organisation is already on the outsourcing route, contemplating it, or feeling forced in that direction, know that you can have a successful engagement. The following items are three things that a provider organisation should do in order to maximise their chances of being happy with their outsourcing firm and results:

Determine What You Will Be Investing

When a provider organisation chooses to outsource their entire revenue cycle, the decision is nearly always made by

the CEO, CFO, and/or health system cabinet. On the other hand, many decisions about potential EBOS engagements are made by revenue cycle departments. Either way, those calling the shots need to understand what will be required of their organisation. Before beginning an engagement, they should know the answers to questions like these:

- What would we be expected to contribute during the implementation phase, and how long will the implementation take?
- What ongoing support would we need to give throughout the engagement?
- How much pushing and pulling of data would we have to do on our end?
- Is there technology behind the firm's solution that could further improve our efficiency?
- What can the firm promise in terms an ROI, and how do they generate those numbers?
- How well does the firm understand our needs?
- How much time, money, and manpower can we afford to invest in an engagement?

Not all engagements are created equal. Different firms have different abilities and require different things from their customers. Provider organisations should learn about firms' offerings and expectations upfront and compare those against the provider organisation's resources.

Find a Firm Who Could Be Your Strategic Partner

The growth of the revenue cycle outsourcing market has led to the emergence of a number of new firms, especially in the area

of point solutions. Certain firms are beginning to offer more standalone services in addition to their full-outsourcing packages. Revenue cycle leaders looking to outsource have more choices than ever. However, not all of these options would benefit your healthcare organisation.

The service firm you choose should be capable of doing more than just the blocking and tackling of the revenue cycle. Could the firm in question be an integrated part of your team, lift other areas of your health system in addition to the revenue cycle, and push for improvements upstream?

Providers must also clarify that the firm's incentives and performance metrics are aligned with the provider organisation's goals. For example, a revenue cycle leader who wants the firm to work on all of the early out self-pay accounts should make sure the firm rewards its employees for taking on the toughest accounts, not just the big ones.

Cultivate a Solid Partnership With Your Firm

A firm's willingness to partner with customers is more important than pricing; partnership is the best predictor of success and, therefore, profitability. The ideal firm should have a reputation for proactive communication and problem resolution. They must be able to ease the provider leaders' concerns about any rebadging of the health system's employees.

Revenue cycle leaders also need to set expectations with their firm upfront to prevent misunderstandings. The health system and firm should create a schedule for regular review meetings and establish the layout and frequency of the firm's performance reports. These measures will establish the transparency both parties will need in order to successfully manage the health system's revenue cycle.

Promising Possibilities

In speaking with hundreds of revenue cycle leaders, one of the biggest industry problems I've noticed is that too many of these leaders haven't heard enough outsourcing stories with happy endings. I would like to share just a few positive comments from KLAS' recent report that show how pleased many providers are with their engagements:

"[Our EBOS firm] has driven higher collections and has helped us with early out self-pay services. They sold that debt in some cases, found insurance, did up-front collections, and helped us with scoring so that we could know which patients to go after. The vendor has helped us to identify charity more quickly, reduce our bad debt, and increase our cash collections."

"[Our RCO firm] is a fully functioning member of our management and leadership structure."

"[Our EBOS firm] is one of the few companies that I would believe if they told me that they wanted to work so hard for us that we wouldn't need them anymore. [This firm] actually tries to work that way."

"From a PR perspective on the self-pay side, [our EBOS engagement] is worth every dime."

Work in the revenue cycle will always be complex, and outsourcing will never be able to solve all of a provider organisation's revenue cycle problems. But with the right firm, engagement type, and collaboration techniques, provider organisations who outsource part or all of their revenue cycle can make great strides.

KEY POINTS



- The revenue cycle outsourcing market is growing quickly. That trend is estimated to continue until at least 2026, particularly in Europe and Asia Pacific.
- According to a 2019 KLAS report, roughly one-third of respondents outsourcing their entire revenue cycle would not purchase services from their firm again.
- Customers' frustrations are generally rooted in limited or delayed tangible outcomes and a lack of alignment in the respective parties' goals. However, most customers outsourcing only part(s) of the revenue cycle are satisfied with their engagements.
- Provider organisations are most likely to achieve success in revenue cycle outsourcing by determining what they need to invest, finding a firm that can be a strategic partner, and creating a solid partnership with their chosen firm.



REFERENCES

Fortune Business Insights (2019) Healthcare Revenue Cycle Management Outsourcing Market 2019 Industry Size by Global Major Companies Profile and Key Regions 2026. Available from [marketwatch.com/press-release/healthcare-revenue-cycle-management-outsourcing-market-2019-industry-size-by-global-major-companies-profile-and-key-regions-2026-fortune-business-insights-2019-06-25](https://www.marketwatch.com/press-release/healthcare-revenue-cycle-management-outsourcing-market-2019-industry-size-by-global-major-companies-profile-and-key-regions-2026-fortune-business-insights-2019-06-25)

Lagasse J (2018) How hospitals can know when to outsource revenue cycle management. Available from [healthcarefinancenews.com/news/how-hospitals-can-know-when-outsource-revenue-cycle-management](https://www.healthcarefinancenews.com/news/how-hospitals-can-know-when-outsource-revenue-cycle-management)

Smart S, Zeitner D (2019) Outsourced Revenue Cycle Services 2019: Are Outsourced Revenue Cycle Services Worth the Investment? Available from [klasresearch.com/report/outsourced-revenue-cycle-services-2019/1467](https://www.klasresearch.com/report/outsourced-revenue-cycle-services-2019/1467)

Use Patient Safety to Improve Your Bottom Line

Summary: At the turn of the twenty-first century, our understanding of the biology of ageing has fundamentally changed thanks to major preclinical breakthroughs, which revived age-old aspirations for eternal youth. However, how close are we, in reality, to achieving this in humans?



David B. Mayer

CEO
Patient Safety Movement
Foundation
USA

Executive Director
MedStar Institute for
Quality and Safety
USA

David.mayer@patient-
safetymovement.org

patientsafetymovement.org/

[@PLAN4ZERO](#)

W. Edward Deming dedicated much of his career studying and analysing various industries and found there are two general approaches to improving quality. In this case, improving patient safety and the quality of care. If the people and organisation focus on managing costs, the quality will be impacted and will decline over time. If an organisation focuses on quality, quality tends to increase and costs decline over time. One reason behind the decrease in cost is that increasing quality can decrease waste and rework. A focus on quality also means investing in the continual improvement of systems, processes and practices.

In the healthcare arena, this begins with establishing a culture of safety and an environment based on transparency, trust and accountability between management, staff, patients and families. For many organisations, this can be a transformational change that requires strong leadership to ensure transparency and encourage accountability. When a patient safety issue arises, it should be addressed openly with the team and resolved as quickly as possible. It's also important to celebrate successes (eg good catches) as you progress to ZERO preventable patient deaths.

A culture of safety allows care teams to learn from the experiences of others, learn from mistakes

and improve processes to avoid preventable medical harm. To create a safe environment while maintaining accountability, leadership and staff must recognise and separate failures of the system or processes from harm caused by individual malfeasance. The concept of a safe, transparent environment that follows 'Just Culture' principles is critical to improving quality. As Deming wrote, "Top management should publish a resolution that no one will lose his job for contribution to quality and productivity."

Changing systems and processes can be challenging but changing culture may be the most difficult obstacle to overcome in your quest for quality improvement and cost reductions. To support your culture of safety, you will need to create an infrastructure that maintains trust and respect, the reporting of unsafe conditions or processes, and continually evaluates and improves processes and systems. The infrastructure should include training, oversight committees, leadership updates an electronic reporting system and even a patient and family advisory committee for quality and safety.

Part of the continual process to eliminate preventable patient harm includes open communication and engagement with patients and their families as well. That's where the CANDOR (Communication and Optimal Resolution) process

comes in. This is a structured process that ensures you respond to patients and staff in an open, honest, and timely way. Transparency is a critical component in reducing patient harm, improving outcomes and quality of care. Deming would very much approve.

KEY POINTS

- W. Edward Deming found that focusing on quality tends to increase quality and decrease cost over time.
- Patient safety issues should be addressed openly and as quickly as possible.
- To establish a safe environment, failures of the system or processes should be separated from harm caused by individual malfeasance.
- To support safety culture, the healthcare infrastructure should be built on trust and respect, and should also become a place where unsafe conditions are reported and constantly improved upon.
- The CANDOR process is structured so that patients and staff are responded to in an open, honest and timely way.

Delivering High-Value Imaging: A Paradigm Shift from Efficiency to Effectiveness

Summary: How can radiologists move towards a model of practice that uses resources and skills effectively and supports high-value care? A leading radiologist and population health scientist explains.



Yoshimi Anzai

Professor of Radiology
Associate Chief Quality
Officer of the University
of Utah Health System
Adjunct Professor of
Population Health Sciences
University of Utah
Utah, USA

Yoshimi.anzai@hsc.utah.edu

utah.edu/

[@yoshimianzai](#)

Medical imaging technology has made tremendous advancements, enabling the accurate diagnosis of various diseases and conditions. In many instances, imaging is critical for diagnosis, determining appropriate management, and triaging patients. Today, no ED physicians would diagnose pneumonia by solely listening to lung, or appendicitis by physical examinations, or pulmonary emboli by calculating risk factors. Imaging has become the GOLD standard for many conditions.

Accordingly, the utilisation of imaging has grown dramatically in the past few decades. At first, this was accompanied by higher levels of reimbursement, but, more recently, various payment reforms have reduced the payment for medical imaging in the United States. Reduced payment for the continuous body parts, known as bundled codes, is a good example. We experienced tremendous financial impact by combining the CT scans of abdomen and pelvis in 2009. Bundled payment for care improvement initiatives is a different type of “bundle” that enforces a single payment for inpatient care provided three days prior to admission to 30 days post discharge in one single payment, beyond traditional diagnosis-related group-based payments

(DRG) from admission to discharge. Payment for imaging performed during the period is included in the bundled payment with surgery and anaesthesia. At the same time, the total imaging volume per case has increased dramatically, in part due to the advancement of technology. Radiologists must detect and interpret a huge volume of information and create a cohesive single report in a short period of time. Radiologists are faced with handling larger volumes with declining unit reimbursement in order to maintain their level of compensation. This creates a “mouse-in-a-wheel” phenomenon where we run endlessly, leading to burnout.

The past focus has been efficiency or how to do things faster, ie improve exam room utilisation for the maximum capacity and report turnaround time to sign off reports faster. These are great business strategies under a fee-for-services payment model where the more we do, the more we get paid. Under this volume-based care model, very little attention has been paid to doing the right thing.

The time is right to focus on making our work more effective. Effectiveness can be understood as doing the right things; the right test (appropriateness), the correct diagnosis (diagnostic

performance), a positive impact on treatment decisions (diagnostic impact), and ultimately making patients healthier (therapeutic impact). Focusing on effectiveness allows us to achieve better outcomes and demonstrates how imaging impacts the entire patient care continuum.

How Do We Make Radiology Practice More Effective?

While many things can help us shift from efficiency to effectiveness models, I would like to illustrate three options that we can make a huge impact:

1) Focus on Appropriateness

We must take the lead on ensuring the appropriate use of imaging tests. Under the volume-based care, there is incentive to do more imaging tests. We may be too busy to address the appropriateness of imaging orders, therefore it is easier to just “do it” instead of spending time discussing appropriate imaging test with ordering providers. It is important to note that this has created a culture of an “imaging order” akin to a takeaway order of food, which is both demeaning to radiologists and not the best care for

patients. The editorial by Bruce Hillman in JACR entitled “Speaking of Language” (Hillman 2015), highlights the notion that words matter. The word, “order” does not get respect. A proper word might be “consultation” since we are physicians with imaging expertise.

"RADIOLOGISTS HANDLE LARGER VOLUMES WITH DECLINING UNIT REIMBURSEMENT TO MAINTAIN THEIR LEVEL OF COMPENSATION CREATING A MOUSE-IN-A-WHEEL PHENOMENON AND LEADING TO BURNOUT"

Admitting that the majority of imaging tests are 'ordered' appropriately, there remain 20-30% of imaging orders that are either wrong tests or inappropriate. Imaging CDS (clinical decision support) provides automatic consultation of relatively simple clinical scenario, such as 'low back pain lasting more than six weeks despite conservative management'. For complex situations, however, we must provide consultation services where radiologists speak with ordering physicians what imaging test best answers a clinical question. No matter how fast we sign a report, if the study was not indicated to begin with or was the wrong test to address the clinical question, we did not make an impact on patient care (other than adding more waste to healthcare delivery). This type of practice does not lead to effective imaging services. The imaging appropriateness is likely enforced more strictly in other countries where the availability of MR, CT, or PET scans is limited or there is strong government oversight.

2) Standardised Imaging Reporting Results

Outside of interventional radiology, imaging reports are the only product we produce in diagnostic radiology. Despite the tremendous technological advancements in the field of medical imaging, narrative forms of radiology reports have not changed for over 120 years. We use a variety of adjectives or adverbs that are not well defined as to the probability of disease, such as 'likely', 'probably', 'may represent', 'possibly', or 'cannot be excluded', etc.

Physicians who receive radiology reports have to guess what these terms might imply. Under the efficiency model, what matters is how fast we sign reports, not how accurate or actionable our reports are (effectiveness). How do we make our reports more actionable?

The best example for making our reports more actionable is the breast imaging reports and database (BI-RADS) used for screening breast cancer. The probability of presence of cancer is categorised by five different numbers. Radiologists have to commit to one out of five numbers for every single report for breast imaging. The BI-RADS system has made imaging an essential and unequivocal part of the breast cancer diagnosis and management. The categorisation of diagnosis (or probability of disease) has also generated the solid foundation of a research database. Furthermore, the RADS system is intimately linked to proper follow-up actions, allowing the standardisation of care process. There are many other RADS systems, such as LI-RADS (liver imaging), PI-RADS (prostate imaging), TI-RADS (thyroid imaging), and NI-RADS (neck imaging), etc. These RADS systems are applicable to specific situations where a diagnosis is binary such as cancer or not cancer, or

recurrence or not recurrence. When a clinical question is not binary, RADS system, however, would not be applicable.

It is understandable that some radiologists feel that these RADS systems represent an unwelcome pressure to commit to a number despite what might be more nuanced findings. Generally, people are reluctant to change their practice unless there is additional payment or an external mandate. RADS systems do not require specific structured reporting. They can still include narrative reporting but, in the end, the radiologist must commit to one number to reflect the probability of disease based on imaging.

Imagine a clinical history is 'left frontal lobe tumour' and an MRI report describes findings but, ultimately, the impression simply states 'left frontal lobe tumour' without addressing differential diagnosis or probability of high-grade tumours. This means the post-test probability did not change from the pre-test probability. In this scenario, the diagnostic impact is zero.

3) Effective Communication

Lack of effective communication is one of the major causes of medical errors and patient harm. This is beyond radiology and pathology, but happens at the point of transition of care. When a care team changes or a patient is discharged, critical information may never be conveyed to the care providers. Radiologists know how hard it is to get in touch with providers in order to verbally communicate critical imaging findings.

Another example is incidental findings in medical imaging. A variety of guidelines exist regarding a

recommendation for follow-up examinations. These guidelines, such as Fleischner society guidelines, are incredibly powerful as they standardise care processes based on imaging findings. If adopted effectively, they provide the model for best practice.

One question is, are guidelines like these enough? What if a patient who has smoking history gets a chest CT to rule out PE (pulmonary emboli) at ED, and the chest CT was negative for PE but showed an 8 mm lung nodule? The radiologist would recommend a follow-up chest CT based on the Fleischner society guidelines. We might give ourselves a pat on the back that we did the right thing. However, how do we, as a health system, know that the patient received an appropriate follow-up examination? Should an ED physician be the one to place another chest CT at six months? Should this be a primary care provider's responsibility? What if the patient does not have a primary care provider? Should we directly inform the patient about the nodule? The series of questions points to the challenges facing every healthcare delivery system and suggests how we might organise ourselves for better patient care.

Data indicates that 20 to 30% of recommendations on incidental findings are not followed or are ignored. For

incidental thyroid nodules, the rate can be as high as 70%. You could argue that incidentally discovered thyroid cancer is indolent, though a small fraction of patients could end up with aggressive thyroid cancer that requires extensive treatment. How do we know which one to ignore and which one to work on? One can argue that is an opportunity for an IT solution, such as a reminder in the EMR to warn that the test is due.

Health policy makers may be concerned that the work up for incidental findings could increase imaging utilisation. However, the detecting lung cancer that is resectable leads to better outcomes and lower costs, than diagnosing it when patients become symptomatic. We need to think cohesively about how we use our resources effectively to providers better care.

In summary, radiologists should consider themselves as imaging information specialists, who observe medical findings that no one else in the care team can. It is our responsibility to work with other healthcare providers, system leaders, and patients to discuss not only how to make a diagnosis but also how we delivery high value imaging services effectively.

KEY POINTS



- The utilisation of imaging has increased over the past few decades.
- A fee-for-services payment model has led to burnout and little focus on doing the right thing.
- Appropriate scans, standardisation of reports and better communication at the point of care transition can lead to more effective radiology practice.
- Radiologists should adopt the role of imaging information specialists for better care delivery.



REFERENCES

Hillman B (2015) Speaking of Language. Available from [jacr.org/article/S1546-1440\(15\)00150-7/fulltext](http://jacr.org/article/S1546-1440(15)00150-7/fulltext)

EUROPEAN CONGRESS OF RADIOLOGY

ECR2020

Vienna, March 11-15

Adagio



REGISTER NOW!

myesr.org/registration

ESR EUROPEAN SOCIETY
OF RADIOLOGY

Public-Private Partnerships: A Win-Win for Danish Healthcare and for the Industry

Summary: The intriguing finding of longevity among the Ikaria inhabitants was the impetus to perform an epidemiological study. Motivated by the IKARIA study, proposed measures of approaching the goal of longevity through delay of cardiovascular ageing will be discussed in this article.



Hans Erik Henriksen

CEO, Healthcare Denmark
Odense, Denmark

heh@healthcaredenmark.dk

healthcaredenmark.dk

@HealthcareDK

While healthcare authorities in many countries are experiencing increasing demands and costs due to an ageing population and more patients with chronic diseases, they are, at the same time, in a kind of opposition to healthcare and pharma companies, which provide solutions and products for their problems.

In Denmark, based on a long legacy of PPPs, the relationship between healthcare authorities and private companies is gradually changing. They stand together to face the challenges of healthcare and work together in PPPs to find new solutions. This is a win-win for healthcare and for the industry.

Public Private Partnerships in Denmark – A Decades-Long Legacy

The tradition of PPPs in Denmark is based on a decades-long legacy where public and private organisations more than 80 years ago realised that they could benefit from closer cooperation even

though, at that time, it was more informal and not PPPs as we know them today.

The Nordic Insulin Laboratory (now Novo Nordisk) was established in 1927. Already in 1932, the company established the first Nordic Diabetes Hospital to treat diabetics, and the public healthcare system soon realised that their patients could benefit from the highly specialised expertise that was available at the Nordic Diabetes Hospital. During the 1930's and 1940's this led to an informal cooperation, where the Nordic Diabetes Hospital contributed to improving the treatment of diabetes in Denmark.

During the 1970's, the cooperation with Nordic Diabetes Hospital was formalised as a public-private collaboration by the County of Copenhagen and Nordic Insulin Laboratory under the name Steno Diabetes Center.

Recently the Steno Diabetes Center in Capital Region was upgraded and expanded and the PPP,

Steno Diabetes Center, is now present in all five healthcare regions in Denmark. A considerable grant of close to €1bln from the Novo Nordisk foundation made it possible to expand this cooperation to cover all of Denmark.

The common vision behind the national Steno Diabetes Centers is to reduce the prevalence of diabetes, increase life years and the quality of life for diabetes patients and reduce diabetes related co-morbidity and complications. All Steno Diabetes Centers in Denmark work to achieve this vision but they address the diabetes challenge in slightly different ways:

- Region North: focus on digital health.
- Central Region: focus on integrated care and prevention.
- South Denmark Region: focus on strengthening primary care services.

- Region Zealand: focus on reducing co-morbidity and improve equal access to diagnostics and treatment.
- Capital Region: focus on world-class research and education.

With both a common vision and, at the same time, addressing diabetes in different ways, the Steno Diabetes Centers build on local strongholds across Denmark, which support research and development in the whole country.

Danish Healthcare Authorities as well as the Novo Nordisk Foundation have a strong interest in ensuring that the grant for the national Steno Diabetes Centers results in new diabetes research and treatment, which would not have been possible without the grant from the Novo Nordisk Foundation. Nobody wants a development where the public-private cooperation tradition gradually results in a situation, where private contribution replaces investments, which would otherwise have been financed by the state of Denmark. This is not only because such a development would reduce the impact of research, but also because it could lead to a private sector-biased prioritisation of research and treatment. This is also the reason why the Steno Diabetes Center project is organised in such a way that Danish Healthcare Authorities are in full control of the project; they have voting rights on the boards and the Novo Nordisk Foundation have observatory members on the boards of the projects.

User-Driven Innovation: The Informal Culture of Public-Private Cooperation

Denmark is internationally known for user-driven innovation – a culture, where the needs for innovation and ideas for

new solutions are based on a strong collaboration between hospitals, universities and private companies.

A typical user-driven innovation project originates from a hospital, a municipality, a primary care organisation or another healthcare organisation, which has identified a problem they want to solve through innovating new concepts or solutions. Often universities or cluster organisations can play a role in motivating healthcare organisations to bring strategic or daily operation problems forward.

"IN DENMARK, THERE IS A LONG TRADITION OF THE PRIVATE AND PUBLIC SECTORS STANDING TOGETHER TO FACE CHALLENGES OF HEALTHCARE AND WORKING TOGETHER TO FIND NEW SOLUTIONS"

User-driven innovation projects may not be based on an idea for an actual product but rather on a problem that needs to be solved. As an example, the Alexandra Institute at Aarhus University and Horsens Regional Hospital initiated a project in the early 2000s to work out a solution to increase the quality and outcome at the surgery department. The early phases of the project focused on hygiene compliance but, it was realised through the process that the biggest contribution to increase quality and outcomes could be achieved by optimising awareness, coordination and collaboration and the project then took a different direction.

As a result, a solution to replace the white boards at the surgery department was developed and after a pilot with the new solution, which is based on big touch screens which represents activities in a new and comprehensive overview, a randomised control trial documented that the new solutions contributed to both increased quality, higher production and a valuable change of the culture among the staff involved.

A spin-off company was then created, and the developed concept and solution is now used widely in Danish hospitals as well as internationally. The project also put a spotlight on the importance and potential of real-time coordination at hospitals – which again inspired further innovation and solutions as described in the Healthcare DENMARK white paper on Hospital Logistics (2017) that is available on the Healthcare DENMARK homepage.

The Industry as a Partner: Private Initiatives Driving Healthcare Sustainability and Transformation

In Denmark, the transformation of healthcare accelerated 15 years ago, when the increasing demands for healthcare services created long waiting lists for treatment at Danish hospitals. Since then Denmark has restructured its hospital sector and new initiatives to strengthen primary care and healthcare services in a municipal setting have been implemented. This includes a focus on e-health and telehealth which again relies on patient education and empowerment.

Recently the private industry introduced initiatives that, in different ways, support the public healthcare system transformation efforts.

Leo Innovation Lab was established by the company Leo Pharma as an independent lab with a mission to improve the lives of people living with chronic skin conditions. Leo Innovation Lab does not address this mission through research in new medical treatments but rather through digital innovation with aims to address the challenges of the modern patient journey.

The programme Cities Changing Diabetes was launched in 2014 by Novo Nordisk, University College London and the Steno Diabetes Center. In collaboration with cities around the world, Cities Changing Diabetes helps communities understand their unique set of diabetes challenges, identify areas and populations at greatest risk, and design targeted interventions that can put change into motion.

"THE HEALTHCARE INDUSTRY IS PLAYING AN INCREASINGLY IMPORTANT ROLE IN TERMS OF INNOVATIVE CONTRIBUTIONS TO OUR HEALTHCARE SYSTEM AND AS AN INDUSTRY THAT CONTRIBUTES TO SOCIETY, WEALTH AND RESEARCH"

In 2019, 25 cities around the world are participating in Cities Changing Diabetes partnerships. In Copenhagen the cooperation resulted in the Copenhagen Centre for Diabetes, which address the local diabetes challenge with new initiatives within prevention and early detection of diabetes, patient mentoring and education. However,

every Cities Changing Diabetes partnership is different and based on a cooperation to address the specific diabetes issues for the partnering city.

The company Coloplast is supporting patient education and empowerment through the Coloplast Care – a portal which provides advice and education to users of catheters and stomia bags. This portal, and the services it provides, is highly valued by patient organisations.

Both Lundbeck Foundation and Novo Nordisk Foundation have recently provided grants of millions of euros to the Danish Personalised Medicine initiative – a public healthcare system initiative that aims to contribute substantially to future healthcare transformation. As a first step within this initiative, the Danish Genome Center has now been established, and when this is in full operation, it will collect DNA and Genome profiles on a national level, in order to share this for research and treatment of patients.

The above examples all illustrate how private initiatives from the industry are supporting public healthcare system transformation in Denmark. Some of the initiatives impact in more indirect ways and others – like the grant for the Personalised Medicine initiative – in more direct ways. The Cities Changing Diabetes initiative is an example of how the Danish tradition for public-private cooperation also inspires international stakeholders and cities.

Public-Private Cooperation, Growth and Community Value

The healthcare industry is playing an increasingly important role for Denmark. This is both in terms of innovative contributions to the development and

transformation of our healthcare system, but also – and especially – as an industry that contributes to society, wealth and research. The Danish healthcare industry export has doubled between 2008 and 2017 and during the second quarter this year, it accounted for a record 20% of all Danish exports. This makes the healthcare industry the strongest growing export industry in Denmark.

A strong healthcare industry stimulates research, job opportunities and talent attraction but the impressive development and the increasing importance of our healthcare sector cannot be taken for granted. This is why the Danish government in 2017 launched a life science growth plan to support the industry but also to contribute to society. The growth plan initiative was a public-private cooperation initiative in itself because it was a committee with members from the private industry, universities and the public healthcare system, which developed the growth plan proposal.

The resulting growth plan, which is now being implemented in Denmark, aims to improve conditions for new investments, strengthen research opportunities and access to research, and also holds initiatives to modernise the Danish Medicines Agency and introduce new models to bring new medicine faster to the market. The establishment of a life science office within the Ministry of Business, to follow up on the execution of the growth plan, is especially important for the impact of the growth plan. The growth plans also emphasise the importance of attracting researchers and talent. A strong life science industry in itself helps attract the best researchers, but more is needed with the current impressive industry growth rates.

Let us take a closer look at the Danish life science growth plan and a few of the 36 policy initiatives in the plan.

Denmark already is the leader in Europe in the area of clinical trials per capita. However, more capacity is needed to support a growing industry. The public-private partnership Trial Nation is a growth plan initiative, which provides one entrance for the industry, with the ambition to help establish faster access to relevant researchers and clinical trials in all five healthcare regions in Denmark and in all relevant hospitals.

A faster introduction of new medicine, which makes a difference for patients and our healthcare system, is important both for healthcare transformation and industry growth. Therefore, as part of the growth plan, The Danish Medicines Agency is being modernised. In order to support a faster introduction of new pharmaceuticals and further support patient access to new treatments, the Danish Medicines Agency has established a risk-sharing pilot project where the industry will get reimbursement of their products, if they share the economic risk involved with the reimbursement.

During recent years, The Danish Medicines Agency has also increased their staff specifically for the approval of new pharmaceuticals and this will continue with a future increase of the staff of scientific advisors, especially within

the field of data analytics. The Danish Medicines Agency will also focus on establishing stronger international relations and co-operation with European and international medical and healthcare regulatory bodies.

These initiatives will lead to faster introduction of new products in a high-quality approval and services process, which is well connected to medical agencies in other countries.

Partnerships Based on Trust and Confidence

The tradition of public-private cooperation in Denmark comes from a long legacy that, over the years, has developed to become more formal, but also to provide more value for both public and private stakeholders.

Gradually, the Danish tradition is changing the relationship between public authorities and the industry, but this relies on a delicate balance where trust and confidence between the parties is essential. Public authorities need to be sure that private companies operate with high ethical standards and private companies need to be confident that contributions from industry do not replace public investment, but instead make an otherwise unachievable aim for the industry and for the community possible.

The above examples show that, when successful, PPPs hold a strong win-win potential for all parties – even to the extent of building and executing an industry growth plan for the benefit of both the industry and society.

KEY POINTS



- The tradition of PPPs has a long history in Denmark.
- PPPs can help deal with healthcare challenges such as the ageing patient and chronic disease.
- Trust and cooperation on both sides are essential for success.
- PPPs can create a win-win situation for all involved parties through practical and innovative solutions from healthcare and industry.



REFERENCES

Healthcare DENMARK (2017) Brand New White Paper about Hospital Logistics. Available from healthcaredenmark.dk/news/listnews/brand-new-white-paper-about-hospital-logistics/

Disruption Is Coming to Healthcare

Summary: No other industry that operates as inefficiently and ineffectively as healthcare has survived disruption in the 21st century. Why does medicine remain the exception and what forces are powerful enough to improve quality and bring costs under control?



Robert Pearl

Professor
Stanford University
Graduate School of Business
and School of Medicine
Author & Forbes Contributor
Podcast Host of
"Fixing Healthcare"

drrobertpearl@gmail.com

robertpearlmd.com

@RobertPearlMD

The United States spent an average of \$10,209 on each citizen in 2017, the last year data were made available. The second highest-spending nation was Switzerland at \$8,009 while Luxembourg came in third, spending \$6,351 per person. Of the world's 195 recognised countries, 185 of them pay less than half of what the United States spends on healthcare per individual. Perhaps this discrepancy could be justified if U.S. clinical outcomes were superior; however, the United States ranks at the bottom of the 11 most industrialised nations in nearly all measures of medical success, including *access*, *equity* and *healthcare outcomes* (Schneider et al. 2017).

Contrary to what many Americans believe, the U.S. healthcare system is overly expensive and, given the quality of the *product*, not a good deal for the money. These facts are well known to policy experts and operational leaders, but the underlying economic causes for the nation's clinical underperformance and lackluster outcomes remain poorly understood.

This article examines why the U.S. healthcare system is so expensive, the steps needed to rebalance the cost-quality ratio, and three feasible scenarios in which American healthcare could be disrupted.

The Inevitability of Disruption

There is a tried and true rule in American industry that overly expensive and underperforming businesses will

be disrupted. There is only one known exception: the American healthcare industry.

Without viable competitors to contest or question standard practices, healthcare costs have continued to rise at a rate of 5% to 6% a year (PwC's Health Research Institute 2019) while the nation's ability to pay for healthcare services (as measured by the Gross Domestic Product and overall inflation) has failed to keep pace, increasing at a rate of only 2% to 3% annually (U.S. Bureau of Economic Analysis 2019). Mathematically, economically and politically, this imbalance is unsustainable. Disruption is inevitable.

If It's Broken But Profitable, Don't Fix It

In the United States, there are a handful of powerful organisations reaping the overwhelming portion of today's rewards while contributing to the system's persistent underperformance. These incumbents include U.S. hospitals, health insurers, physician specialty societies and drug makers. Given the profitability of their respective industry sectors, it's no wonder they defend the status quo and refuse to admit the system is *broken*.

Stock prices for the three-largest private insurers – United Healthcare, Cigna and Humana – have doubled over the past five years. Hospital and physician services represent half of total health spending in the United States. Meanwhile, nearly 30 drug makers took steps in

2019 to increase the prices (and profits) of more than 1,000 medications.

It's not that these players couldn't help reform healthcare. They're simply doing too well at present to change. They expect today's good fortune will remain tomorrow's reality. However, history teaches us that those who fail to innovate, or address inefficiencies, will be left behind. It is well known that Kodak could have been a global leader in filmless cameras. Likewise, Yellow Cab could have offered Uber-like technology long before Uber was founded. They had the technology, the capital and the know-how required, but each refused to embrace change until it was too late. U.S. healthcare organisations are following a similar pattern.

Compared to those in other developed nations, Americans pay nearly double for almost every part of the delivery system, including clinician salaries, a hospital day, drugs, medical technology and malpractice coverage. This is partly because the most powerful players in healthcare enjoy the freedom of near-monopolistic pricing in a growing number of markets. When hospitals consolidate, when pharmaceutical companies become sole sources for life-maintaining drugs and when physicians form single-specialty medical groups, health insurers have no choice but to contract with them, no matter the cost. Contributing to the problem is the way private insurance masks the true costs of healthcare, blinding patients to all but one

financial metric: out-of-pocket costs. Patients know what healthcare costs them, personally, but as a result of out-of-pocket maximums, it makes little difference to them whether the bill sent to their insurer totals \$20,000 or \$120,000. Americans pay the same deductible either way.

"COMPARED TO THOSE IN OTHER DEVELOPED NATIONS, AMERICANS PAY NEARLY DOUBLE FOR ALMOST EVERY PART OF THE DELIVERY SYSTEM, INCLUDING CLINICIAN SALARIES, A HOSPITAL DAY, DRUGS, MEDICAL TECHNOLOGY AND MALPRACTICE COVERAGE"

Further complicating the price problems, the United States spends disproportionately more on high-ticket items like medical specialists, diagnostic machines, surgical robots and complex interventions whereas other countries prioritise higher-value (and lower-cost) services such as primary care, preventive medicine and generic medications.

Two Paths Towards Affordable Healthcare

The simplest and fastest solution to address the cost-quality gap would be to align U.S. prices with the rest of the world, using Europe as the standard. Under that scenario, insurance companies would pay doctors and hospitals 40% less than they do today. In response, hospitals would reduce nurse and staff salaries by an equivalent amount. Congress would allow the federal government to set drug prices at about half of the current rate and so on. Each of these changes would be bitterly opposed by medical associations, unions and powerful industry lobbyists. In the United States, the two industries

that spend the most on effecting political outcomes are pharmaceuticals and insurance. Over the past 20 years, they've expended a combined \$6.64 billion on lobbying.

The other option for helping purchasers and patients spend less on healthcare: make the delivery system more efficient and productive. As difficult as that would be, it is the easier of the two paths. But higher productivity will require major changes in the (1) reimbursement, (2) structure and (3) delivery of American healthcare.

Three Pillars of Productivity

1. Rethinking Reimbursement

The first change needed will be to shift from a fee-for-service payment system that rewards volume to a capitated one that focuses on the efficiency and effectiveness of medical care. The federal government is slowly moving in the direction of *pay for value*, and commercial insurers need to follow. In the \$3.5-trillion U.S. healthcare industry, 30 cents out of every U.S. dollar spent is wasted on unnecessary, ineffective or harmful care. Nevertheless, America's fee-for-service payment model incents doctors, hospitals and drug manufacturers to continue, uninterrupted, along their current paths. Achieving higher productivity in medicine will require the opposite. Capitation aligns incentives for doctors, hospitals and patients to maximise operational efficiency, reduce medical expenses through prevention and eliminate high-cost interventions that add no value.

2. Restructuring Hospitals

The next change required will be to consolidate and close 20% to 30% of all U.S. hospitals to achieve economies of scale, eliminate hospital-bed and medical-device redundancy

and provide higher quality clinical care. This has not been the intent of industry consolidation thus far. In fact, since 1998, more than 1,400 hospitals have merged for the primary purposes of increasing clout with insurers and raising the price of hospital services.

Closures will be a tough pill to swallow in any geography. In rural areas, hospitals are major employers and a large source of community-pride. But with miniscule daily volumes (the number of patients hospitalised on any given day), these facilities rarely achieve top quality rankings from independent research organisations like Leapfrog Group. Many rural hospitals remain economically viable only because the federal government pays them higher rates, thus reducing the likelihood of closure.

A better solution in rural settings would be to shutter the inpatient areas of underperforming hospitals while maintaining 24-hour emergency services. This is not legally permissible at present. Congress could simultaneously enact laws that would funnel federal and state dollars toward the creation of an efficient rural transportation system, making it possible for small-town patients to receive even better care at high-volume facilities after initial ER care. Further, lawmakers could incentivise the use of inexpensive video technologies, thus connecting patients in sparsely populated geographies with highly skilled specialists for consultation and treatment. Not only would these approaches increase quality outcomes by making superior expertise more readily available, they would offset the community's economic loss of local healthcare jobs through the newly created ones in the transportation and information technology sectors.

3. Rebalancing Care Delivery

The third shift is to refocus the nation's emphasis to primary care and prevention, rather than specialty care and

intervention. A recent Harvard-Stanford research collaboration examined life expectancy rates in the United States from 2005 to 2015. The team found that adding 10 primary care physicians to a population of 100,000 people is associated with an average life-expectancy increase of 51.5 days but only a 19.2-day increase when adding an equal number of specialists. In other words, adding 10 primary care physicians has a 250% greater influence on life expectancy than hiring the same number of specialists. However, the research also found that the density of primary care physicians declined by 11% between 2005 and 2015, falling from 46.6 to 41.4 per 100,000 people (Basu et al. 2019).

To reverse this troublesome trend, our nation will need to alter the U.S. residency training process. At present, hospitals receive identical reimbursement (through the government-funded Medicare programme) whether they train a surgical specialist or a primary care physician. Recognising the greater value of primary care physicians, and their recent decline in numbers, the funding agency could de-incentivise the training of specialists while boosting reimbursements for primary care training programmes. An added benefit of this approach is that the decline in the number of specialists would result in higher volumes and greater expertise for each of the remaining specialists. This would, in turn, lead to fewer complications, better clinical outcomes and greater cost efficiencies.

Technological changes will be necessary to maximise the value of primary care. This begins with making every patient's medical information available to care providers at every point of contact, be it outpatient or inpatient. To accomplish that, current electronic health record (EHR) systems will need to be more user-friendly transitioned onto tablets and designed to facilitate data flow between devices. The easiest path to that end is via federal legislation, requiring all EHR vendors to

open their Application Processing Interfaces (APIs) to third-party developers. Doing so would allow for the interoperability of EHR systems and the development of time-saving apps for clinicians, analogous to what currently exists on smartphones, tablets and computers.

Three Disruptors Waiting in the Wings

Implementation of the three pillars described above will be opposed by the institutions and organisations benefiting from today's inefficiencies. That is why fundamental change is most likely to occur from outside the medical mainstream. Already, there are three disruptive entities pushing healthcare's legacy players outside of their comfort zones:

1. Haven, a medical nonprofit led by the esteemed Dr. Atul Gawande, was founded to provide superior medical care to more than one million employees of Amazon, Berkshire Hathaway and JPMorgan Chase. However, anyone who believes this organisation intends to remain an employee-only nonprofit for the long term likely thinks that Amazon still sells only books. Once these industry giants grasp the ins and outs of the U.S. healthcare system and medical care delivery, they will quickly turn their attention towards monetisation. This switch could prove as disruptive to the current providers of healthcare as Amazon proved to book stores. Haven has not yet articulated its 10-year plan, but industry experts speculate this nonprofit could someday establish a new model of care, replacing health plans with a retail business-model, replacing in-person visits with virtual care and replacing the fragmented system of care with a one-stop-shop that puts patients at the center of everything.

The second possible source for disruption will be large, self-funded businesses. A recent example, reported on by the New York Times (Galewitz 2019), was a company in Wisconsin that offered employees who required a total joint replacement \$5,000 to have it done in Mexico and sent a Mayo Clinic orthopaedic surgeon to do the procedure. Similarly, Walmart has chosen specific hospitals in the U.S. for its total joint procedures based on high volumes, excellent outcomes and lower prices. By working together, these purchasers have the power to shift the setting of care delivery from local communities to centres of excellence. By selecting and covering only a few high-volume centres for their employees, U.S. businesses can drive hospital consolidation, lower prices and increase overall clinical performance. If, together, they announced that in five years' time they would only pay for their employees to receive medical care through high-quality, technologically advanced multispecialty medical groups and hospitals, the delivery system would have no choice but to comply.

2. The final possibility for disrupting the American healthcare system comes from offshore. Dr. Devi Shetty has built a hospital in the Grand Cayman Islands that does heart surgery with results that match the best in the United States at half the price. His surgeons do twice the annual volume of procedures as in the U.S., which is why they can accomplish these outstanding results. He is currently expanding the services provided in a wide-range of areas including cancer, orthopaedics and transplantation. His facility, located on this island paradise, is an hour plane ride from Miami. Today, employers and commercial insurers are reluctant to send employees outside the United

States for medical care. However, as purchasers find they can't afford the rapidly rising costs of American healthcare services, they may just decide to outsource much of the work, similar to what they've done in manufacturing and telecommunications. Once Shetty's facility, and others like it, start attracting hundreds of thousands of patients, they will force the closure of inefficient U.S. hospitals and drive American providers to become more productive, if only to stay viable.

Conclusion

The opportunities to address the challenges of healthcare today aren't just theoretical. As CEO of The Permanente Medical Group, I was responsible for the healthcare of over 5 million Kaiser Permanente members in California, Virginia, Maryland and Washington, D.C. We applied these overarching principles in the geographies we served and not only led the nation in quality (per NCQA ratings), but also reduced hospital utilisation to half the national average, became a global leader in telemedicine and lowered total medical costs by 10% to 15% compared to surrounding programmes (based on the resulting price of the healthcare premiums).

Putting the pieces together, U.S. healthcare suffers not from a lack of available solutions. What's missing is (a) the desire of current incumbents to embrace change and (b) the courage of governmental officials to enforce it. Without doubt, those doing financially well in today's inefficient healthcare system will resist change. But before they dig in their heels, they would be wise to remember those industry leaders who learned the hard way that refusing to change can be fatal.

KEY POINTS



- U.S. healthcare costs continue to rise faster than the nation's ability to pay. This trendline is proving to be mathematically, economically and politically unsustainable.
- History teaches that the failure to innovate and refusal to address operational inefficiencies is a deadly combination in American commerce. U.S. healthcare organisations are following a similar pattern.
- Making the healthcare delivery system more efficient and productive will require three pillars upon which all future changes will be built: (1) rethinking reimbursement, (2) restructuring hospitals, (3) rebalancing care delivery.
- Assuming these three pillars will be opposed by the institutions and organisations benefiting from today's inefficiencies, American healthcare might experience disruption from Haven, from large self-funded businesses or potentially from offshore.



REFERENCES

Basu S, Berkowitz SA, Phillips RL et al. (2019) Association of Primary Care Physician Supply With Population Mortality in the United States, 2005-2015. *JAMA Intern Med*, 179(4):506-514.

Galewitz P (2019) A Mexican Hospital, an American Surgeon, and a \$5,000 Check. *The New York Times*. Available from [nytimes.com/2019/08/09/business/medical-tourism-mexico.html](https://www.nytimes.com/2019/08/09/business/medical-tourism-mexico.html)

Institute of Medicine (2013) *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America*. The National Academies Press. Available from [nap.edu/catalog/13444/best-care-at-lower-cost-the-path-to-continuously-learning](https://www.nap.edu/catalog/13444/best-care-at-lower-cost-the-path-to-continuously-learning)

Kamal R, Cox C (2018) How has U.S. spending on healthcare changed over time? Peterson-Kaiser. Available from [healthsystemtracker.org/chart-collection/u-s-spending-healthcare-changed-time/](https://www.healthsystemtracker.org/chart-collection/u-s-spending-healthcare-changed-time/)

OECD (2017) *Health at a Glance 2017: OECD Indicators*. OECD Publishing. Available from data.oecd.org/healthres/health-spending.htm

PwC's Health Research Institute (2019) *Medical cost trend: Behind the numbers 2020*. Available from [pwc.com/us/en/industries/health-industries/assets/pwc-hri-behind-the-numbers-2020.pdf](https://www.pwc.com/us/en/industries/health-industries/assets/pwc-hri-behind-the-numbers-2020.pdf)

Schneider EC et al. (2017) *Mirror, Mirror 2017: International Comparison Reflects Flaws and Opportunities for Better U.S. Health Care*. The Commonwealth Fund. Available from [commonwealthfund.org/sites/default/files/documents/___media_files_publications_fund_report_2017_jul_schneider_mirror_mirror_2017.pdf](https://www.commonwealthfund.org/sites/default/files/documents/___media_files_publications_fund_report_2017_jul_schneider_mirror_mirror_2017.pdf)

Healthcare Data: Creating a Learning Healthcare Ecosystem

Summary: The future of global healthcare requires a shift towards a real-time, digital learning healthcare ecosystem, but how can we use patient data to achieve this goal?



Elia Stupka

SVP & General Manager
Life Sciences Business,
Health Catalyst
USA

[in](#) @eliastupka

[t](#) @estupka



Healthcare data is seen by many as the ‘new goldmine,’ with many businesses in this field evaluated and sold at a significant value. Flatiron, the start-up acquired by Roche for 1.9 billion dollars, has utilised a specialised Oncology electronic medical record (EMR) system to collect sophisticated data on cancer patients to be used by third parties. Many other companies, including Optum, COTA Healthcare, Concerto Health AI and IQVIA, have built similar business models with different sizes and complexities.

The underlying premise is that once the data is fully de-identified it can be used by third parties for purposes other than the standard of care, empowering discoveries, etc. This has led most pharma companies to invest heavily in ‘Real World Data’ departments, which purchase, aggregate and analyse data to derive insights and better inform value-based models. Last but not least, de-identification offers a way to collaborate across provider organisations effectively, as Health Catalyst already does for more than 500 hospitals in the U.S. and around the world.

And yet, when we talk about healthcare data we are ultimately talking about patient data, their

lives, their disease, their treatments, their deaths. And often they are kept out of the loop, not benefitting or engaging with how their data is being used. Patients are increasingly demanding a more active involvement in their health, which is difficult to adhere to when the patient data is de-identified. As individuals become increasingly aware of how their data is handled, we will need to evolve more and more towards models that engage the patients and ensure that, wherever possible, they are informed about projects involving their data, and can receive some value back. Many companies are now moving to provide services in this area, such as HUGO Health and Belong.Life, which aims to deliver connected patient communities.

As the model has taken ground, healthcare data has evolved to become its own asset class. When evaluating a start-up, venture funds price healthcare data assets based on two variables: total number of patients covered and the depth/granularity of the data (number of years of follow-up, the richness of data from clinical, to genomics, to imaging, and level of completeness). When surveyed, most patients are willing to donate their data to research, but they are more enthusiastic to do so when they can learn how their data has benefitted others affected by the same disease or the future of research. Through the de-identification process, it is hard to communicate back to the patient any of the findings and to conduct longitudinal studies. Also, there are several uses of de-identified data that are driving highly commercial use cases (eg analysing market share across geographies or demographics for a specific product) which patients would be less likely to support especially if it is associated

with a brand or company that has been in the news for the wrong reasons.

This situation often leaves many healthcare providers with highly debated questions:

- Do we rent/sell the data of our patients and is it ethical to do so?
- Do we sell it via one of the intermediary companies that exist already or pursue our own commercialisation route?
- Do we want to limit the permitted uses for our data and how do we enforce it?
- How do we make sure our organisations and patients benefit beyond the revenue stream that this might generate?

"HEALTHCARE DATA IS SEEN BY MANY AS THE NEW GOLDMINE"

So far, different provider organisations have chosen to answer these questions in radically different ways, from some that forbid any commercial activity pertaining their data, to those that exercised it as a pure revenue diversification option, which re-sell it to multiple commercial providers and has no active engagement in the process. But there are some fundamental principles to consider when pondering these questions and how Health Catalyst will build out our life sciences business using our relationships with our providers and their patients' data.

Why Sell Data? Why Not Just Monetise its Analysis?

At Health Catalyst, we have chosen not to sell the de-identified data that we obtain from our clients, though we do provide it to academic entities for non-commercial uses. Our focus is to work with industry on specific projects that will have an impact on patient outcomes and/or advance R&D of new therapies where its use can be tracked.

We are not the only company squarely focused on outcome improvement. Many digital therapeutics companies use data and digital means to improve patients' lives, one example is Omada Health. As Lucia Savage, their Chief Privacy and Regulatory Officer pointed out in her testimony to the U.S. Senate HELP committee recently, there is a growing consensus that a clinical fact (eg your blood glucose reading from this morning) cannot be purchased and sold, as it is a biological reality that belongs to the patient that provided the blood sample. That is not to say companies cannot create revenues by organising or analysing those facts to improve outcomes. But it raises the emerging idea that the underlying data ought not to be purchased and sold.

Clearly ethical and legal positions differ from one country and state to the other, but I believe we are moving towards a next-generation revenue model in this space that will revolve less around the licensing of the data, and more on how the data can be used to derive value, as healthcare is pushed further and further towards value-based models.

Outcome-Driven Neutral Third Parties Are Key

Healthcare worldwide is driven primarily by three types of entities: payers, providers and manufacturers. If we accept that data has become a very precious asset that can be utilised in a wide variety of ways, we must also accept that it can be used in more ethical ways (eg improving clinical outcomes for patients) and less ethical (increasing profits for one of the primary healthcare players without improving outcomes or, worse, decreasing clinical outcomes).

Therefore, it would be best if large data assets were not handled by entities that are owned by one of the three elements of the ecosystem, but by third parties focused on improving clinical outcomes. Some of the current players are directly owned by one industry entity, eg Flatiron acquired by Roche, a pharma company, and Optum belongs to a payer United Healthcare. While these companies are certainly aware of the potential conflicts of interest and attempt to mitigate them, a neutral ecosystem would be more conducive to drive the interest of the patient.

Diverse Data Sets

Larger healthcare systems are tempted to think that their data is so extensive that it should warrant its own dedicated internal commercial strategy. Similarly, some hospitals create their own collaborations and partnerships with a few other hospitals to build collaborative datasets. Health systems should resist this temptation. What we routinely hear from pharma and other industries is that they still see a very fragmented picture of a patient journey.

When a pharma company is using the data to understand the patients' pathway and outcomes, they need to see the full richness and diversity. Especially the differences that exist across states, countries, rural and urban environments and race, ethnicity, age, gender and also socioeconomic status. As we move towards a data-centric world and we utilise more analytics and artificial intelligence, the richness of the data used becomes crucial. At Health Catalyst, we already bring together data from more than 150 million patients, with a broad diversity, across several countries and most U.S. states. This also benefits providers as they can leverage much broader populations for benchmarking or for research studies.

"PATIENTS ARE INCREASINGLY DEMANDING A MORE ACTIVE INVOLVEMENT IN THEIR HEALTH"

By bringing together data from different countries and health systems, patients will also benefit. As an example, many biotech companies are developing new curative gene therapies for rare diseases and they often struggle to find enough patients for participation. If we had global access to digital health information these companies could have a worldwide reach, in real-time, giving hope to many that would otherwise die. Similarly, by comparing and learning from some of the most advanced academic centres, smaller less sophisticated health systems can benefit from improved diagnosis methods and treatment pathways for their patients. Unfortunately, the disparity in how patients are diagnosed and treated is

very wide. Digital technologies could significantly bridge this divide.

Data Use for Measurable Improvements

At Health Catalyst, we commit to empowering our clients to obtain measurable improvements which are data-driven, verified and are sustained over time to impact outcomes, efficiency and streamlining of operations. We also publish those improvements to explain how they were achieved methodologically and have so far published more than 200 success stories. As we aggregate data from millions of patients and build a life sciences business we remain focused on ensuring that a pharma-sponsored project delivers improved outcomes for the patient.

For example, these can be the creation of an algorithm to identify patients that can benefit or should avoid a drug intervention, the deployment of training and management tools to adhere to new published clinical guidelines, or the creation of a risk-based pharma-provider contract through us, where payment is issued on the basis of measurable outcome improvement. As providers embark on third party use of the data, and want to adhere to their mission and their ethical frameworks, this guiding principle helps to navigate the ground between 'doing nothing out of fear' (never use the data with third parties) and 'selling data' (with no control over how it is used). Ultimately, the more patient-centric these models become, the more patients can engage and be informed about their data, allowing providers to navigate this middle ground more positively.

The Shifting Healthcare Landscape

If we truly care about improving healthcare globally, we must recognise the complex ecosystem we have created around it and how rapidly it is shifting. Employers in some countries like the U.S. are starting to create their own strategies to improve employee health. Start-ups are disrupting many areas, from the natural language processing of clinical notes to the enrolment of patients in trials and the creation of virtual clinical trials. Governments and private payers are shifting their models to value-based care. Manufacturers are investing in digital health as well as building contracts directly with providers for expensive drugs. Global large not-for-profit organisations, as well as corporations, are shifting financial and innovation boundaries, rapidly giving access to digital health to economies in the developing world. Given the pace of change, the ability to coordinate and interact with other organisations under the premise of a very well-defined purpose is fundamental and requires open access to data, purpose-driven revenue models, and utilisation of digital technologies to solve future challenges.

Moving Towards a Global Learning Healthcare Ecosystem

One day a mother in a small town in Indonesia will wake up to find her son severely sick with very unusual

symptoms. She will pick up her phone and activate a video chatbot, describe the symptoms and shoot a video of the child. The chatbot will access an open and intelligent digital ecosystem of knowledge, data, expertise and capabilities worldwide and determine the top three most likely diagnoses in real-time. Three of the top specialists will be notified and will create a virtual board to determine a single diagnosis. If further tests are needed they will be ordered automatically and delivered efficiently by drone or at a locally affiliated nail salon.

Once the diagnosis is clear, all treatment options will be evaluated, taking into account personal and logistic factors, which will then be communicated to a local community worker to explain the pros and cons. When the mother exercises her choice, all the necessary supplies, logistics and appointments will be scheduled and sent to her and her community worker for acceptance or modification.

If the mother chooses a clinical trial, as soon as her son's outcome is measured in real-time and achieves statistical significance, it informs all other organisations, doctors and patients involved in similar trials to modify their design and the risk profile communicated to the patient. All payments have been handled under a Netflix-like, subscription-based model and adjusted based on the clinical outcome, income and insurance coverage of the patient in question.

Conclusion

We have all the elements required to create a learning healthcare ecosystem. We have learnt to digitise biological and medical data, we have wearable devices, chatbots, global virtual presence. So far, they all live in very small silos, as each organisation focuses on their turf. If we can all shift towards the massively transformational purpose of a real-time, connected, digital learning healthcare ecosystem, our children and grandchildren will hopefully see a world where most diseases will be prevented, diagnosed and treated for all citizens and hospital stays will be a thing of the past for most patients.

KEY POINTS



- Patients want to be more involved in their health, this can be difficult to implement when data is de-identified.
- Next-generation revenue models will start to focus on how data can be used to derive value instead of the data licensing.
- Large data assets should be handled by third parties focused on improving clinical outcomes.
- The richness of the data used in analytics and artificial intelligence is crucial.
- Health Catalyst wants to empower clients to obtain measurable improvements in their healthcare systems..



Apply for the Value-Based Health Care Prize 2020

Apply now and become the next VBHC Prize winner!

The 7th VBHC Prize Event May 14th 2020

For more information, subscribe to the newsletter www.vbhcprize.com

Why you should apply for the VBHC Prize 2020:

- ❖ Give your initiative a **boost** through exposure to more than 400,000 healthcare professionals
- ❖ Gain feedback from the **international expert jury**
- ❖ Obtain **recognition** as an inspiring initiative that creates excellent patient value
- ❖ **Celebrate** the success and hard work of all who focus on increasing patient value
- ❖ **Network** with other VBHC experts



Fred van Eenennaam

Chairman
VBHC Center Europe
The Netherlands

fveenennaam@thedecisiongroup.nl

www.vbhc.eu

 @fredvaneennaam

 @VBHCEurope



Lena van Selm

VBHC Content Officer
VBHC Center Europe
The Netherlands

lvselm@thedecisiongroup.nl

www.vbhc.eu

 @VBHCEurope

Digital Transformation for More Effective Healthcare: Inspiring VBHC Initiatives

Summary: By combining digital transformation with the core VBHC initiatives, we can provide effective, patient-centred care for the future.

The way the healthcare sector is currently organised is not financially sustainable. To provide qualitative, patient-centred and effective care in the future, a different mindset on valuing health outcomes is required. Usage of the right software in combination with Value-Based Healthcare (VBHC) implementation offers great opportunities to provide more effective care. Many examples of VBHC initiatives with superior results through digital transformation are now available.

Imagine being a patient suffering from chronic kidney disease. Lately, you have been experiencing some abnormal symptoms and your General Practitioner doesn't have the tools or knowledge to help you properly. Tomorrow an appointment with your nephrologist is planned, the day after with your dietitian and in a week, you will be seeing your cardiologist. Now imagine you don't need any of these visits because your institute effectively uses digital tools. This would allow you to measure your vital signs from home. Hospital smart scheduling software could schedule the appointments on the same day, you could have one or more meetings digitally from home or work, and smart data sharing between care providers makes it so that you don't have to tell the same story over and over again explaining your situation.

This example shows how digital transformation can have a huge positive impact on the quality of healthcare experienced by the patient, while at the same time save costs by minimising under- and overuse of care. Without a doubt, if we do not start using the opportunities of digital tools within healthcare, the problem of costs rising exponentially worldwide cannot be tackled. Also, we need to systematically change the way the healthcare system is organised by focusing on creating better health outcomes for patients to reduce costs, according to Michael Porter's VBHC model (Porter 2010). Luckily, we now have wonderful software available to support VBHC implementations, all for a low price per patient. Using these technologies, which can all be linked to one of the VBHC principles (Table 1), will be necessary to financially sustain a healthcare sector that is working in an effective, efficient and ethical way.

Usage of Smart Tools for Real-Time Measurement

Measuring the number of consultations between a patient and doctor is easy, yet measuring the value of each of these consultations for the patient is a lot harder. Porter's equation – where patient value is defined as the health outcomes per money spent over the full cycle of care – provides a common definition

of value for all stakeholders in healthcare. The number of digital tools to make outcome measurement and costs measurement easier is rapidly increasing, for both clinical outcome measures and Patient-Reported Outcome Measures (PROMs).

NightWatch is a great example of this in the field of epilepsy care. The unpredictability associated with having a seizure is one of the main factors impacting the quality of life for many epilepsy patients and their caretakers. To reduce the experience of constant fear, an interdisciplinary team created NightWatch: using video and audio algorithms, the bracelet can be worn by epilepsy patients and warns for potentially dangerous nocturnal seizures. This allows caretakers to take action at an earlier stage of the seizure leading to a reduction in the long-term negative impact on the patient's body. Besides the physical benefits, one can imagine that improving this will also have a positive impact on the mental health of both the patients and their caretakers.

Instead of paying for each episode of care, the principle of bundled payments creates a fee for a clearly defined 'total package' of care for certain medical conditions. To implement this successfully, a tool is needed which can exchange the information on health outcomes and costs of the whole patient



Marlou Smits

Writer for VBHC Thinkers Platform
 VBHC Center Europe
 The Netherlands

M.Smits@thedecisiongroup.nl

www.vbhc.eu

@VBHCEurope

The Four Principles of VBHC	Possibilities with Digital Transformation
I. Measuring patient value with patient-relevant outcomes and costs	A. Smart tools allow real-time measurement of health outcomes and costs
II. Patients & families and doctors & teams create value	B. Patients can now be digitally connected to the best healthcare providers 24 /7
III. Healthcare delivery is a team sport. Organisational arrangements must be adopted so that doctors can drive patient centricity	C. Data collected throughout the whole care pathway can be used to increase shared decision making
IV. All patients benefit from protocols but no protocol fits any patient perfectly	D. Personalised digital patient environments can provide personalised pathways and protocols for patients

Table 1. The Four Principles of VBHC, by VBHC Center Europe, Linked to the Possibilities of Digital Transformation

pathway. **Edifecs** is a real front-runner when it comes to adopting IT solutions to track and process health information. This American company wants to get rid of data silos and separate systems. By exchanging administrative and clinical data in a better way, it can connect and enhance interactions to increase data quality and compliance.

24/7 Support System

Being connected 24/7 as a doctor and patient can bring a lot of benefits when it comes to improving health outcomes. Moreover, continuous monitoring of data can bring great opportunities to prevent both over- and underuse of care.

HartWacht, winner of the Collaboration Award during the VBHC Prize 2019, is a great example

of the use of technology in health outcomes measurement (Figure 1). HartWacht consists of home measurement devices connected with applications on the smartphone or tablet. Patients suffering from heart failure, hypertension or arrhythmia can measure their blood pressure, weight and/or heartbeat and put their data in the application. The data is integrated into the electronic patient file and interpreted by a team of nurses and cardiologists, supported by smart algorithms. Patients are then contacted when their measures are abnormal. This approach can minimise unnecessary appointments, detect deficiencies early on, and can adequately handle the early stages of the disease. The use of HartWacht has resulted in fewer outpatient visits and fewer visits to emergency departments.

The Right Data for the Right Decisions

In data we trust. This accounts for most sectors, but when it comes to the health sector it is especially essential. Useful data collection and data exchange between healthcare providers are now more important than ever. Since the digitalisation of health records, it has become easier to track a patient’s pathway within a certain health institution. However, when a patient goes to a different healthcare provider, the right data is often unavailable. Exchanging Electronic Health Records (EHRs) between different providers is crucial in improving a patient’s care path, especially in the long run. The technology to do so is out there, the question is: “How can we implement this in a way that all players can benefit from it?”

Awell Health uses technology in a way that it is made for: to connect. They have created a platform that helps to collect data throughout care pathways, via the patients’ channel of choice. Awell Health integrates the data with the EHR and uses algorithms to predict the risks of relapses and readmissions. By making this platform useable for care teams and patients, better-informed decisions can be made from both sides. Moreover, doctors can be more productive and reduce emergency room admissions for patients in their pathway, which has shown positive results.

A great example of the implementation of Awell Health’s software is the lung cancer project in collaboration with the **AZ Delta hospital** in Belgium

The lung cancer team at AZ Delta has provided integrated care and designed their ‘ideal care pathway.’ However, implementing, monitoring and continuous improvement of this pathway turned out to be very time-consuming. After implementing the Awell Health

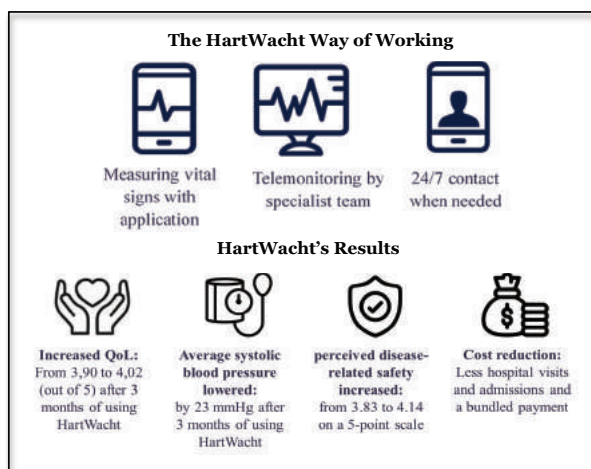


Figure 1. The HartWacht Way of Working and Results

platform the pathways could be executed more quickly and linked to the EHRs. The digital care pathway helped the team to further engage patients and general practitioners in the care pathway, to gain more insights into health outcomes and to become more productive. This has already led to a decrease in ER admissions.

Personalised Digital Care Pathways and Protocols

Imagine a random sample of twenty children with a broken arm and twenty children who were just diagnosed with having diabetes. For those with a broken arm, similar protocols and decision trees can be used to provide similar care. On the contrary, for those with diabetes, there is more variance in the needs of the patient. For more complex, especially chronic, diseases a different approach of applying protocols is needed.

Diabeter is doing this in a tremendous way. Patient pathways are very flexible, adapting to the patient's personalised needs. By organising the care around the patient, all support needed can be found in one place. Moreover, they have their own digital system where all patient data is stored both by the health professional, patient, and family. This allows its medical team to provide 'real-time' care from a distance, based on the personalised needs of the patient. Decreased haemoglobin (HbA1c) levels, fewer hospital admissions and increased patient satisfaction has shown successful implementation of the technology in different areas of the patient pathway. Next to providing care, the institute uses easily accessible data to ethically conduct research with the aim of improving diabetes care as a whole.

Moving Forward

All of these initiatives show how thinking differently from the traditional, systematic way of providing healthcare can drastically improve patient value and efficiency of care. To have a long-lasting impact, the way we look at innovation in healthcare should receive more attention, so technology can be used to its fullest potential. Digitalisation on its own will not be sufficient to provide patient-centred, qualitative and financially sustainable healthcare. Therefore, it is essential to integrate it properly with an organisational model that focuses on creating patient value. Let's use these – and other VBHC initiatives – as a source of inspiration to move forward and improve the delivery system in healthcare.

Want to see more examples of successful VBHC implementation? Visit the VBHC Prize website (vbhcprize.com).

Become a VBHC Green Belt and learn more about VBHC (thedecisioninstitute.nl).

Find the answers to the rest of your questions about

VBHC and become a member of VBHC Center Europe. Where you can gain unlimited access to breakthrough VBHC articles in the VBHC Knowledge Bank (vbhc.nl/membership)

KEY POINTS

- Digital transformation can improve quality of healthcare while also saving costs and minimising under- and overuse of care.
- By linking new technology to the VBHC principles accounts for efficient and ethical development in the healthcare sector.
- Digital tools are now available which record the outcome and costs measurements for the benefit of clinicians and patients.
- Continuous monitoring of data can bring great opportunities to prevent the over- and underuse of care.
- Digitalisation of health records has made it easier to track a patient's care pathway.
- Digital systems can be adapted to a patient's specific pathway and personalised needs.



REFERENCES

Porter ME (2010) What Is Value in Health Care? *The New England Journal of Medicine*, 363(26): 2477-2481.

Closing the Cycle of Research, Prevention, Diagnosis, Monitoring and Treatment with a Simple Finger Sensor

Summary: Noninvasive, continuous haemodynamic assessment in clinically proven quality made easy.



Walter Habenbacher
Head of Sales & Marketing
CNSystems

feedback@cnsystems.com

www.cnsystems.com

Easy-to-use and reliable methods for a clinically valuable cardiovascular assessment have become inevitable at a time when cardiovascular disease (CVD) is the number one cause of death¹ and postoperative complications causing long hospital stays are not the only facts placing significant economic burden on healthcare services worldwide.

Noninvasive, continuous arterial blood pressure monitoring (CNAP®) – as offered by CNSystems – has fulfilled this claim for over 20 years for closing the cycle of prevention, early detection, continuous monitoring and efficient treatment. More than 900 studies in many different application fields reflect the reliability and versatile usability of this market-leading technology, which not only enhanced standard intermittent methods with continuous information, but also revolutionised cardiovascular monitoring by providing full haemodynamics from simple finger sensors.^{2,3}

The method is, for instance, very much appreciated in the field of hypertension prevention in order to closely investigate its influencing factors with the goal to early detect, predict and ideally prevent this widespread disease. Studies with our technology not only underlined that physical exercise has a positive impact on the CV system,^{4,5} but also confirmed that

prompt antihypertensive treatment may contribute to a stabilised cardiovascular state and reversed health effects.⁶

Haemodynamic and autonomic assessment also plays an important role in the diagnosis and management of Syncope, which is still a challenging task in medical practice⁷ requiring noninvasive, continuous and easy-to-use equipment for efficient haemodynamic and autonomic monitoring. Numerous study groups have used our technology during head-up tilt-tests to provoke unconsciousness and get a detailed insight in the physiological mechanisms during syncopal events.^{8,9}

CNAP® has even convinced with its reliability and the potential to improve patient outcome and save cost in the very sensitive field of perioperative medicine. Noninvasive solutions are not only associated with less risks, but also with fewer complications for the patient than invasive methods. Benes et al. (2015) showed that Goal Directed Therapy based on pulse pressure variation from CNAP® applied in intermediate risk patients undergoing hip or knee replacement, reduced postoperative wound infection, the number one complication and essential cost driver in surgical patients,¹⁰ by 61%.¹¹



The range of applications for our noninvasive technology is wide. CNAP® can be used wherever there is the need for continuous monitoring but no indication for invasive solutions. It is easy to use, practically without any risks and clinically proven with the same accuracy as invasive reference methods.

CASH COW

GLOBAL HEALTHCARE FINANCIAL OUTLOOK



Source: <https://iii.hm/zkz>

HEALTHCARE INDUSTRY RISING EXPENDITURES

- Costly digital technologies
- Expensive advances in innovation
- Increased healthcare demand
- Demand for personalised care
- Demand for expanded delivery sites
- Increasing labour costs
- Cybersecurity

Source: <https://iii.hm/zl0>

HEALTHCARE INDUSTRY CONTINUES TO GROW

- 01 Ageing population
- 02 Increased life expectancy
- 03 Increasing prevalence of chronic diseases
- 04 Increasing prevalence of non-communicable diseases

Source: <https://iii.hm/zl0>

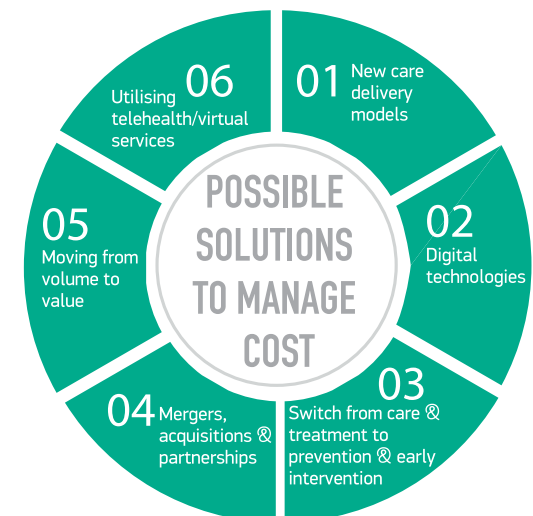
"It is health that is real wealth and not pieces of silver and gold."

Mahatma Gandhi

TOP FIVE HEALTHCARE COMPANIES

- 1 United Health Corp
- 2 Medtronic
- 3 Abbott Laboratories
- 4 Thermo Fisher Scientific
- 5 McKesson Corporation

Source: <https://iii.hm/zl1>



Source: <https://iii.hm/zl0>

Medical Image Exchange in the Cloud: A More Efficient Way

Summary: Groundbreaking study at the University at Buffalo uses brain stimulation to assess how large-scale patterns of brain activity could vary between cognitive systems and across people.



Miguel Cabrer
eHealth Innovation Consultant
Founder, Idonia
Medical Exchange
Palma de Mallorca, Spain

mcabrer@idonia.com

idonia.com

[@mcabrer](https://twitter.com/mcabrer)

Medical imaging is an important element of most healthcare processes and contributes to accurate disease diagnosis and treatment. Medical imaging technology is advancing and improving every day and new devices and techniques are possible. Thus, medical imaging utilisation continues to rise (Bindman et al. 2019).

But it's unclear whether the growth in medical imaging use benefits patients; in fact, it can lead to patient harm (over diagnosis, radiation, etc). Like all aspects of medicine, it's important to make sure imaging is justified and that the potential benefits are balanced against the potential harms (Bindman et al. 2019).

Public health concerns about radiation exposure from medical imaging have intensified globally. In Europe, European Commission regulated safety standards for protection against the dangers arising from exposure to ionising radiation through the Directive 2013/59/EURATOM.

A study published in September in the Journal of the American Medical Association indicates that use of CT, MRI, and ultrasound in the U.S. rapidly increased between 2000 and 2016.

The study results suggest that much more work needs to be done to contain imaging use rates and determine whether the imaging that is used is appropriate. The study also says it's estimated that 30% or more of imaging examinations may be unnecessary, costing approximately \$30 billion

annually in the United States. For example, in the trauma space, injured patients often undergo imaging that gets repeated, adding cost and radiation exposure while not significantly altering outcomes. The CT scans that are remotely accessible can delay procedures up to 25 minutes for review due to wasted time (Emick et al. 2012). In the stroke environment, where "Time is Brain", quick exchange of CT scan is a critical issue.

Radiologists have a real opportunity to work with their referring providers to help guide them in how and when to image, and when not to image. Radiologists also need to figure out ways to be available for consultation. Doing this would have a real impact on testing utilisation.

It is also important that patients are engaged and informed participants as to their care. As initiatives are developed to improve patient access to their medical records, radiologists can play a key role in advocating to reduce barriers to electronic access: widening access to imaging studies should be included in the overarching goal of improving health information transparency and patient-centered care (Carolyn et al. 2019).

Image Studies Delivery to Patients

If hospitals are to support patients as informed healthcare partners, they should be offered copies of their imaging studies in formats that they can easily view, transport, and share. Then the incipient technical obsolescence of CDs is an immediate issue (Lye et

al. 2019).

Likewise, humans are fallible by nature and keeping track of medical imaging on CDs offers plenty options for errors (lost, damage, etc) and the process of requesting imaging tests from hospitals is complex and lengthy (forms, picking up, etc).

CD and DVD have been used since early 90's, and are still the most common media of providing a copy of imaging studies to patients. They are also used to exchange images between professionals outside the hospital and health system.

In parallel, the CD and DVD are becoming obsolete formats. Many computers don't have a CD/DVD reader anymore and burning robots is a technology that generates several maintenance problems with low availability due to complexity of the robot.

According to research published in June in Radiology (Lye et al. 2019), most hospitals still rely on this archaic medium to provide patients with copies of their imaging studies. In this study, from 80 surveyed top hospitals in the U.S., only six of the hospitals could provide patients with imaging studies over email, and only three offered access via a patient portal. All of them were offering the imaging studies on CD or DVD.

Moreover, the provision of a CD is not immediate. Hospitals commit to an agreed period (24 hours to 30 days) for CD burning and delivery. Some of them were also charging significant costs for the delivery process.

The majority of patients would like to receive copies of their reports and most of them (85%) would also prefer to view their images (Cabarrus et al. 2015).

"IT'S UNCLEAR WHETHER THE GROWTH IN MEDICAL IMAGING USE BENEFITS PATIENTS; IN FACT, IT CAN LEAD TO PATIENT HARM THROUGH OVER DIAGNOSIS AND RADIATION"

Cloud Exchange to Replace CD

As commented on above,

- Medical imaging utilisation continues to grow.
- Patient access to medical records and images is beneficial for cost control and patients themselves; and
- Patients are willing to have access to their imaging studies and report.

But CD is definitely not a useful technology for the exchange and delivery of imaging studies.

Even if the patient gets a CD with the imaging studies, exchanging, reviewing the images and uploading to medical records is still a challenge. Healthcare is changing and new health and global models are emerging. Digital exchange of medical records, including images in a secure way, is key for new process (second opinion, telemedicine, etc). It needs to accelerate the implementation of IT as other sectors have been doing. In the article, Let's Change Before We Have To there is some interesting discussion about the need to implement technology effectively for improved liaising and better health outcomes (Cabrer 2018).

Today's cloud solutions easily allow to securely exchange, share, collaborate and provide access to documents for different purposes.

According to Becker's Hospital Review, hospitals are currently spending between \$8 and \$15 per CD. In some cases, health systems spend as much as \$100,000 per year in courier costs alone just to transport CDs from hospital to hospital.

Online remote access to PACS systems and VPN seems the next step for medical image delivery and exchange. By providing a login and password, external users can access and review the images. This has had a high impact in healthcare delivery processes by reducing costs and time to access to medical images.

However, most of those hospitals are still burning CDs due to patients demand or processes where username/password access is complex. Thus, for example, one of the biggest hospitals in Europe, having a portal to access medical images, is still burning 100 CDs per day. What is more important, remote access to PACS is not something CIO recommend since it can directly affect performance and security of the local PACS infrastructure.

Medical Imaging and cloud computing could become the most data and computing intensive activities in future (Shini et al. 2012). There are arising some medical image cloud exchange platforms that can be combined with a local PACS system as a mechanism for easy exchange with outside physicians and patients. Such combinations would also complement and reinforce the PACS architecture by providing a backup and recovery system in case PACS has failover. Some solutions are coming from PACS vendors but some, like Idonia, are vendor neutral and introduce smart ways to deliver images to any patient (Magic Link) to fully replace CD.

Time saving and easy exchange of medical images is becoming a critical element not only for improvements in

patient care and satisfaction but also for reducing physician burnout. As an example, at the University of New Mexico (Moya 2010), a digital image exchange platform was put in place that allowed trauma physicians to see patient imaging before the patient arrived. As a result, the physicians were able to determine that many (up to 40% of patients) did in fact not need to be transferred to their facility. The cost reduction and benefit for the patient is huge.

It's clear then that the cloud exchange of medical images can benefit medical centres to exchange and deliver image studies. Combined with PACS or working independently, it will facilitate the easy exchange of imaging. Using a cloud exchange platform to deliver image studies to patients can reduce costs over 50%.

But then, the data privacy issue appears as a main barrier and concern for delivering medical data over the Internet. Let's analyse more in depth the regulations and discuss if cloud services are a help or a hindrance.

Data Privacy and Security Regulations

Security is a principle issue for the health sector and patients, and it is the main way to protect the fundamental rights to privacy.

Security is defined as the preservation of confidentiality, integrity and availability of information. Confidentiality is the assurance that information is not made available or disclosed to unauthorised individuals, entities or processes. On the other hand, integrity is the assurance that the data being secured hasn't been tampered (European Council 2016).

The main obstacles to security are the risk and Cyber vulnerabilities (Suryateja 2018), including Data Breaches (hacking and taking over of accounts, insufficient identity credential access management, malware and ransomware, insider theft, human error), lack of due diligence in security regulations, data loss or non-compliance with regulations, such as HIPAA or GDPR.

Precisely new regulations about data protection and security are already making positive contributions to improve security, especially in the health sector. Protecting healthcare information security, privacy and confidentiality is a continuous process and serious responsibility of every healthcare organisation. To ensure the security of information processing, data controllers must implement appropriate technical and organisational measures in order to protect it against unauthorised access or disclosure or destruction.

International and national regulations about privacy and data protection laws have been strongly pushed in the last years (like ISO security standards). In the United States, the Health Insurance Portability and Accountability Act (HIPAA) is the sector regulatory in special protected personal data. Korea, Australia and China, are also creating data protection legislation. Generally, this regulation demand additional layers of security for medical data storage, exchange, and use.

In Europe, the General Data Protection Regulation (2016/679 GDPR) has recently been published. The GDPR is a regulation in EU law on data protection and privacy for all individual citizens of the European Union (EU) and the European Economic Area (EEA). It also addresses the transfer of personal data outside the EU and EEA areas.

This regulation has changed deeply the European privacy framework ensuring data protection in digital environments. The scale and reach of the GDPR extend far beyond the EU's borders. Any organisation that holds data on EU citizens, regardless of where it is located or operates, is affected by this legislation. Similarly, companies housing, processing or transmitting data within the EU on any data subject, regardless of their location, may also be in scope (INFOSEC 2010).

Data concerning health is defined by GDPR as "personal data related to the physical or mental health of a natural person, including the provision of health care services, which reveal information about his or her health status". Therefore, medical images are protected by this regulation.

European citizens, under GDPR, and as holders of data have the right to access and to obtain a copy of it in a common format and the right to the portability of data (Guanyabens 2019).

There are also national initiatives for regulation. Within the scope of the Spanish Electronic Administration, the National Security Scheme (ENS) aims to establish the security policy in the use of electronic media and is constituted by basic principles and minimum requirements that allow adequate protection of information.

Cloud Computing in Healthcare

Cloud computing is emerging as a solution to the challenge of delivering complex services and data interchange over the Internet. It has quickly attracted worldwide usage and is now part of our daily life. The increasing success of cloud computing is due to the low cost and increasing ubiquitous presence of fast networks, which make it economically viable to access large amounts of data remotely and in real time.

Cloud computing raises several ethical concerns in healthcare and there are many detractors. The main reason is because control over data is transferred from the institution to a third party, namely, the service provider for cloud computing.

But Cloud Services can help health organisations to better achieve their security, safety and compliance objectives, sometimes even better than with onsite infrastructure. There are some reasons cloud services can

provide secure and GDPR compliant infrastructure (ENISA 2012):

Scaling: all kinds of security measures are cheaper when implemented on a larger scale. This includes all kinds of defensive measures such as filtering, patch management, hardening of virtual machine instances and hypervisors, etc. Other benefits of scale include multiple locations, edge networks (content delivered or processed closer to its destination), timeliness of response to incidents, threat management.

Business (market differentiator): security is a priority concern for many cloud customers; many of them will make buying choices on the basis of the reputation for confidentiality, integrity and resilience of, and the security services offered by, a provider. This is a strong driver for cloud providers to improve security practices.

Effective and efficient updates: they can be rolled out many times more rapidly across a homogenous platform than in traditional client-based systems that rely on the patching model.

Rapid and smart scaling of resources: the ability of the cloud provider to dynamically reallocate resources for filtering, traffic shaping, authentication, encryption, etc, to defensive measures has obvious advantages for resilience.

Resource concentration: although the concentration of resources can have disadvantages for security it has the obvious advantage of cheaper physical perimeterisation and physical access control (per unit resource) and the easier and cheaper application of many security-related processes.

Cloud providers already bring built-in capabilities to easily help health organisations to meet various requirements of the GDPR. Ranging from granular controls that can be defined, to integration with centralised authentication management services and industry-leading methods to protect and maintain the availability of data, offer a wide set of powerful capabilities to address data privacy principles in the data platform tier.

Health organisations will need to invest significantly to ensure the GDPR principles are effectively implemented and sustained in their environments. Cloud computing is quickly evolving into a key service for healthcare organisations, as providers are seeking out the best option to keep personal data secure, easy to maintain, secure to exchange and not hinder daily operations.

Global and main cloud providers are doing efforts in ensuring GDPR compliance while using their services. Google Cloud is making serious efforts to comply with international regulations like GDPR and HIPAA, but also to comply with local regulations. For example, Google Cloud platform is certified by the National Security Scheme (ENS) from the Spanish Government in the Higher Level (required for health data). Amazon (AWS) and Microsoft Cloud (Azzure) are also implementing the mechanism to facilitate relations compliance. The debate between a high-level professional cloud service and ethical concerns of using those services in healthcare is open, but we can agree technology provides the technical mechanisms to adapt to security regulations like GDPR and ensure international transactions can be achieved ensuring the citizens data privacy.

Conclusion

Patient access to medical records and images is beneficial for cost control and patient's engagement in healthcare

processes, and patients want access to their imaging studies and report. CD is becoming obsolete.

Data privacy regulations (GDPR, HIPAA) are helping to protect citizens data privacy, but really complex to manage. Cloud technology provides a secure and regulation compliant solution to facilitate data exchange.

Since cloud services can provide secure mechanisms for GDPR and HIPAA compliance, they will become a proper solution for medical image exchange and delivery. Specialised cloud medical image exchange platforms will be consolidating overall if they also reduce costs and allow easier delivery to patients of their medical studies. We just need to be sure the service allows the coverage of all exchange workflows (including non-digital-expert patients) and so the CD is no longer needed.

KEY POINTS

- Medical imaging is a crucial part of healthcare processes but it's not always clear how it benefits patients.
- In the interests of patient engagement, hospitals should offer imaging files in accessible, easy-to-transport formats.
- Patient access to records is valuable for time and saving costs.
- Security needs of patients must be taken into account.
- Its low cost could make the cloud computing framework a viable alternative for delivery of imaging records



REFERENCES

- Cabarrus M, Naeger DM, Rybkin A et al. (2015) Patients prefer results from the ordering provider and access to their radiology reports. *J Am Coll Radiol*, 12(6): 556-562.
- Cabrer M (2018) Let's change before we have to. *HealthManagement.org*, 18(1): 2084.
- Emick DM, Carey TS, Charles AG et al. (2012) Repeat imaging in trauma transfers: a retrospective analysis of computed tomography scans repeated upon arrival to a Level I trauma center. *J Trauma Acute Care Surg*, 72(5): 1255-62.
- European Union Agency for Network and Information Security (ENISA) (2012) Cloud Computing. Benefits, risks and recommendations for information security. Available from resilience.enisa.europa.eu/cloud-security-and-resilience/publications/cloud-computing-benefits-risks-and-recommendations-for-information-security
- Guanyabens J (2019) Patient Trust Needed for Healthcare Data Success. *HealthManagement.org*, 19(4): 317-319.
- INFOSEC (2019) How has the GDPR changed the role of a security manager. Available from resources.infosecinstitute.com/security-manager-roles-and-gdpr
- Lye CT, Krumholz HM, Eckroate JE et al. (2019) Evaluation of the Patient Request Process for Radiology Imaging in U.S. Hospitals. *Radiology*, 292(2): 409-413.
- Moya M, Valdez J, Yonas H et al. (2010) The impact of a telehealth web-based solution on neurosurgery triage and consultation. *Telemed J E Health*, 16(9): 945-9.
- Regulation (EU) 2016/679 of European Parliament and Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation). Available from eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0679
- Shini SG, Thomas T, Chithranjan K (2012) Cloud Based Medical Image Exchange-Security Challenges. *Procedia Engineering*, 38: 3454-3461.
- Smith-Bindman R, Kwan ML, Marlow EC et al. (2019) Trends in Use of Medical Imaging in US Health Care Systems and in Ontario, Canada, 2000-2016. *JAMA*, 322(9): 843-856.
- Suryateja PS (2018) Threats and Vulnerabilities of Cloud Computing: A Review. *International Journal Of Computer Sciences And Engineering*, 6(3): 297-302.



The Role of EIT Health in Training the European Health Workforce

Summary: EIT Health, a network organisation supported by the European Union, is addressing the impact technology is having on both healthcare employees and end user patients through innovative training that upskills the health workforce and improves patient care.



Annick Ducher
Education Programme Manager
EIT Health
Munich, Germany

annick.ducher@eithealth.eu

eithealth.eu

@EITHealth



Ursula Mühle
Director of Education
EIT Health
Munich, Germany

Ursula.muehle@eithealth.eu

eithealth.eu

@UrsulaMuehle



EIT Health is a Knowledge and Innovation Community (KIC) established by the European Institute for Innovation & Technology (EIT) in 2016. Bringing together research, innovation and

education, its network of partners works together to innovate solutions to Europe's most pressing healthcare needs, ultimately to enable European citizens to live longer, healthier lives.

In terms of education, EIT Health is delivering cutting-edge, innovative trainings to prepare the health workforce to navigate future challenges brought on by an ever-evolving technological and digital landscape in the health and healthcare sectors. These trainings address a large span of learners, from students and researchers to executives, professionals, early entrepreneurs, citizens and patients.

Disruptive Trends in the Health and Healthcare Sectors

Our society is currently undergoing a transformation that will have a high impact on new professions eliminating old professions and creating new ones (Bughin et al. 2018). Understanding the scope and the trends influencing that current transformation will help us to understand the skills needed for the future. In this context, in 2018, EIT Health began to take a closer look at disruptive trends that are transforming the health and healthcare sectors, and thereby identifying European Skill Needs that EIT Health shall prioritise in its development of novel education programmes designed for the future health workforce. Only by knowing what skills are relevant for the future, will we be able to prepare

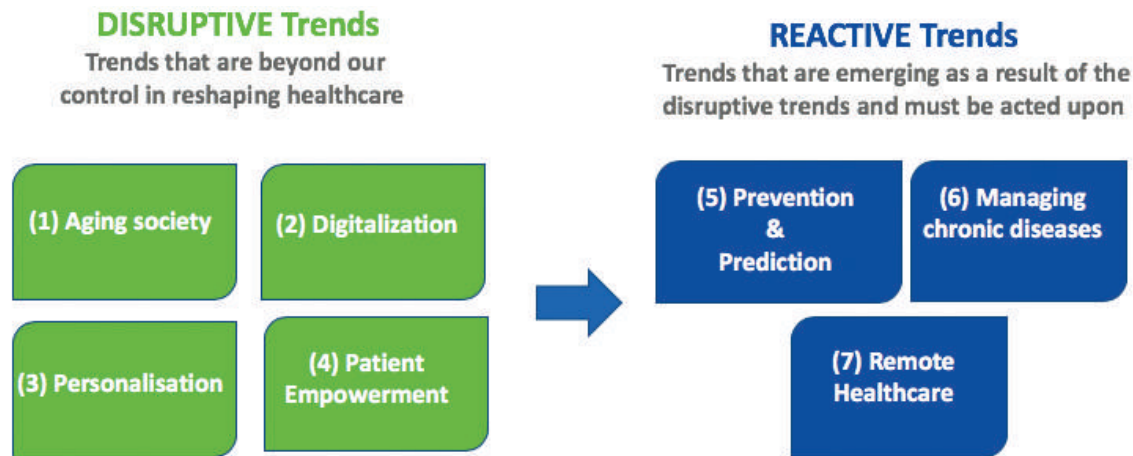


Figure 1. Disruptive and Reactive Trends in Healthcare as Classified by EIT Health.

the future health workforce and thus uphold Europe's innovation capacity.

"TO UNDERSTAND HOW HEALTH PROFESSIONS WILL CHANGE, WE NEED TO UNDERSTAND TRENDS WHICH ARE DRIVING THE 4TH INDUSTRIAL REVOLUTION AND HOW THEY AFFECT SKILL NEEDS"

To understand how health professions will change, we need to understand several ongoing trends which are driving the 4th industrial revolution and how they are affecting the skill needs. The world population has been speedily increasing and growing older, the burden of chronic diseases is also increasing, while the supply

of medical professionals are unable to meet the growing needs of patients. Technological developments have also remarkably been on the rise in the last decades (Meskó et al. 2017). Some of these innovations and advances seek to improve the patient experience and reduce the burden of healthcare-related costs, however, the advances have also brought on new challenges particularly for health and healthcare professions. These trends are depicted in Figure 1. EIT Health has classified them as 'disruptive' vs. 'reactive' trends:

Disruptive trends are reshaping healthcare and are beyond our control, while reactive trends are emerging as a reaction to these disruptive trends.

Digitalisation: a Closer Look

In our work, we have come to define digitalisation in health and healthcare as involving data, software and tools to analyse and exchange data and hardware to

Box 1. Necessary digital competencies

- Basic digital skills
- Advanced data analysis and mathematical skills
- Quantitative and statistical skills
- Advanced IT and programming skills
- Complex information processing and interpretation skills
- Quantitative and statistical skills
- Machine Learning
- Data Mining
- Genomic knowledge and genetic interpretation skills; and
- Automation

provide new tools. The current worldwide rise in the volume and availability of data goes along with an increase of tools and means to analyse and exchange information. Overall, digitalisation in healthcare has already started to change the ways in which diagnoses are made, treatments are designed, the delivery of healthcare services to patients and, ultimately, the patient experience.

The trend of digitalisation imposes the need for new digital competencies among practitioners, healthcare professionals' ability to make rational decisions, and the understanding and engagement of the patient him/herself. In our research, we have defined these skills as the competencies to develop and use digital tools with the purpose of accessing, managing, analysing and interpreting data. Ten relevant skills in this area were identified listed here in Box 1.

EIT Health: Providing Training in Health Digitalisation on a European Level

EIT Health partners are working together to create innovative education offerings and trainings for multiple learner groups, from students and researchers to

executives, professionals, early entrepreneurs, citizens and patients. In terms of digitalisation, we aim to provide training and deliver cutting-edge skills on the one hand to health professionals and executives who will adopt and adapt to new technological developments in their workplace; on the other hand, we also train the end user in other words, the citizens and the patients.

EIT Health prepares health professionals to respond to these disruptive trends, for example:

- Real World Evidence already enabled over 500 professionals to understand and innovate the process of real-world data analysis. The aim of the blended training is to lead health professionals to make better decisions in healthcare.
- TeleSTAR teaches professionals how to use a full digital surgical microscope and augmented reality for better practice; and
- Future Skills for Digital Transformation proposes a blended format to train healthcare professionals in the areas of agile development, machine learning, data analytics and blockchain.

In terms of citizen and patient training, EIT Health ultimately aims to improve the health and well-being of European patients and citizens, following a patient-centred approach, where individuals' specific health needs and health outcomes are the driving force behind all healthcare decisions and quality measurements.

These trainings are designed to empower patients and citizens to use available knowledge, approaches, tools and methods in health innovation to manage their own health while actively taking part in the innovation process – all for the benefit of improved individual and population health outcomes. In this area of work, some best practices include:

- ONCOMMUN provides cancer patients with an innovative platform that merges social nets, videoconferences and monitoring tools. The activity already offered psychosocial support to 500 patients.
- HEALTHY LONELINESS empowers elder citizens with tools to tackle their loneliness, improve their self-esteem and fostering the development of online care systems at home.
- Silver Starters empowers seniors to become entrepreneurs by training elder citizens in how to start their own businesses in healthy living and active ageing.
- E-PRO is a MOOC course which empowers cancer patients to gain science-proof knowledge on radiotherapy and make informed decisions regarding treatment options.
- Get Wise will create an innovative online platform to provide patients with intellectual disabilities with knowledge, skills and confidence to manage their own health; and
- ACTIVEHIP will provide hip fracture patients and their caregivers with an integral tool to manage patients' health. The online platform will include content on physical exercises, nutrition, medication and environmental recommendations.

Looking to the Future: Health Professional Education on a European Level

EIT Health's mandate is to act as an incubator of innovative health education programmes. Our mission also strengthens and contributes to the wider European

health agenda. We expect that our efforts will be adopted by the European education market and continue to thrive and shape Europe's future professionals and leaders. As the landscape of digital transformation continues to morph at a rapid pace, the trainings are designed to meet the challenges of lifelong learning to help health professionals thrive in the future.

KEY POINTS



- EIT Health aims to be an incubator of innovation in health education programmes.
- The focus is on understanding the 4th industrial revolution in order to devise relevant training for professionals and citizens.
- EIT Health has identified the need for training in cutting-edge technology to prepare healthcare for the future.
- The organisation trains both healthcare professional and end users in technology use for rounded engagement and better care.
- EIT Health has already and continues to undertake successful training across the professional and patient spectrum.



REFERENCES

Bughin J, Hazan E, Lund S et al. (2018) Skill shift automation and the future of the workforce. Available from mckinsey.com/featured-insights/future-of-work/skill-shift-automation-and-the-future-of-the-workforce

Meskó B, Drobni Z, Bényei É et al. (2017) Digital health is a cultural transformation of traditional healthcare. Available from ncbi.nlm.nih.gov/pubmed/29184890

27-30 January 2020
Dubai, United Arab Emirates

Where the healthcare world comes to do business

4,250
exhibiting companies

55,000
healthcare professional

159
countries represented

14 CME
conferences



Start planning your participation at the MENA region's largest medical event.

Arab Health 
By Informa Markets

arabhealthonline.com

Together for a healthier world

The ABC of Patient Engagement: Time to Breathe New Life Into Old Stories

Summary: A medical communications expert looks at how industry's relationship with the patient has changed over 25 years and what is necessary for successful future liaison.



Emma Sutcliffe
Director, Patient Engagement
and Innovation
NexGen Healthcare
Communications
London, UK
emma@nexgenhc.com



It is twenty-five years since I first started working in medical communications and with patient organisations. In 1995 there was no such thing as 'patient-centred behaviours.' There was clinical

research, some communication with physicians and the occasional reference to 'quality of life' or disease awareness campaigns. Patient organisations existed as offshoots of traditional fundraising - medical

charities where at best a patient, or their carer, might be able to retrieve a 'patient information leaflet' which was usually a woefully inadequate listing of the potential adverse events of a pharmacotherapy. The concept of real world evidence, patient-relevant communication or a patient-reported outcome was the antithesis of the clinical trial protocol or the clinical study programme. Patients were seen and not heard; their lives outside of a hospital, trial centre or their GP surgery was non-existent. On reflection, it is no surprise that for medicine and research to become holistic it took a ruthless level of activism to make the pharmaceutical industry and medical leaders take notice of patients – it was the 'Act Up' patient organisation who first translated rhetoric into research.

Reflections and Ruthlessness

Act Up was the near-militant activism group lobbying for better research for treatments for people living with HIV. In 1995, following almost a decade of political campaigning and refusing to capitulate to hysteria in place of research, the breakthrough, life-saving medications in the form of protease inhibitors achieved the unachievable. The beginning of the end for 'the killer virus' was the drugs that took the surrogate marker for drug efficacy to combat HIV – viral load level – down to 'undetectable,' the nirvana for an antiretroviral treatment. As a trainee medical

BREATHE Principles

- **BOOST:** Patients want tips, interventions, and interactions that help them live not that boast about a product
- **REAL:** Issues need to be authentic and products must work in the real world
- **ENTERTAIN:** It is hard work living with a condition that affects your quality of life; make light where appropriate
- **ACTION:** Don't inundate; activate. Let people contribute, share, donate, add their skills to the mix
- **TRUST:** Let patients know you, your people, your aspirations, your dedication, your services – then your products
- **HELP:** Provide channels and tech that are practical in customer-friendly modes and open a long-term dialogue
- **EARN:** The final rule is to empower YOU to be more visible. It is ok to be here. With us. As fellow patients

Figure 1. BREATHE Principles: Simple Rules to Breathe Life into Patient Engagement

writer in 1995, the first work I ever did on 'patient voice' was writing a video for a European HIV Activist Group about these drugs; I will never forget the fax from the lab with 'undetectable' listed as the response to treatment. Nor will I forget meetings I attended with medical leaders on different continents in follow-up as the drugs were launched and introduced – where the clinical met the real world. It is one thing reading lab data; it is another thing entirely listening to how difficult it is to use drugs, to be adherent to a treatment regimen, to cope with side effects of medication when you don't have 24/7 support. Even today, there is still stigma and medication-fatigue from the 'mental load' of living with

a now chronic condition. It is important to deal with the psychological impact of the acute and the chronic on the everyday life of a patient.

Therein lies the explanation of why patient-centricity and treating 'the whole patient' counts more than facts on a page. The eponymous 'Ward 5b' hospital transition to 'patient-centred care' for people with HIV, for example, was another 'first;' health managers altered their viewpoints on things that matter to a patient, such as no limits on visiting hours, saying hello to a patient, showing care. In pharmaceutical companies, we started to understand that like it or not, HIV activists would challenge every aspect of a clinical trial and would be relentless in their pursuit of better treatments and beyond-the-pill support that would enable their response to therapy and return to a life worth living. The foundations for a patient-first mentality were laid (HIV.gov 2016).

Recrudescence: The Rare and the Share

As we enter the next decade of patient-centricity, the striving to keep patient-focussed in drug development prevails. We are still trying to find the right ways to equilibrate the sedulous necessity of the clinical trial with the holistic needs of the patient. Industry struggles to recruit and retain patients for the duration of a trial and for people living with or caring for patients with a rare condition, 'trial sinking' is an action that people are still willing to consider if they don't feel that the answers are arriving fast enough (Ledford 2018). In October 2019, Dr. Eric Topol, described the way that we communicate to patients as 'woefully inadequate'. There is still work to be done to collaborate and progress the concept of treating the 'whole patient' (Topol 2014).

To hear and understand the needs of patients, companies must initiate projects through social channels, invest efforts into creating Patient Reported Outcome tools using digital technologies and enable/sponsor connected, real-world concierge services that build patient-generated evidence of confidence in pharma and a company's products.

A company that demonstrates good patient engagement will commit to providing the ABC:

- Awareness of the customer's needs.
- Behavioural health change support; and
- Care and contribution services that are enduring.

Several companies have consolidated all ABC elements into 'Branded Services offerings' for patients; examples of industry standards include Vertex Pharmaceutical's branded GPS programme, Biogen's 'Above MS', Genzyme's MS One to One portfolio programmes, AstraZeneca's AZ & Me clinical education and prescription savings programmes and Abbvie's MyHUMIRA support programme for all of Humira's autoimmune indications. The 'MS for the 21st Century' is an outstanding example of an 'ABC' project and I have worked closely with Grunenthal to launch and contribute to the creation of 'Painsolve,' a health and wellness platform assimilating insights around the underlying pathology of multiple pain conditions.

When companies commit to creating a whole patient 'ABC culture' where patients are regarded as subject area experts it expedites collaboration ensuring that patients can be active partners in research. At last, we are starting to recognise that we have a lot to do to improve patients' capacity to be in control of their conditions. We are thinking about how to improve patients' abilities to manage their

conditions, and take that insight and embed it within clinical trial programmes that extend to a person's entire life.

"ERIC TOPOL HAS DESCRIBED THE WAY THAT WE COMMUNICATE TO PATIENTS AS WOEFULLY INADEQUATE"

Reputation and Rules

At NexGen, we bridge POs and pharmaceutical companies by urging both parties to incorporate the 'BREATHE Principles' into their patient support programmes (Figure 1). We try to encourage that all patient initiatives and engagement start with a simple call-to-action. We embark on whole patient collaborations that question; 'patients live with their condition every day – do you?' hopeful that the answer to this will illustrate how to get closer to patients on their terms with the things that matter to them.

The consolidation of patient engagement activities generates multiple pockets of representative data which assemble to provide big data and broad insights. Every engagement is a touchpoint opportunity with patients; ensuring quality engagement at the 'little data' level unlocks big data that is accurate, insightful and reflects the voice of both the masses and the individual. This approach is a

progressive one, which provides the foundation for a long-standing and trusted set of relationships with patients. Reciprocally, this means a company with a 'whole patient' culture will be uniquely positioned as a patient-preferred partner with an implicit understanding of their disease, their unmet need and their therapeutic burden (Dreyer and Rodriguez 2016).

A quarter of a century since my first foray into patient education and communication can be summarised into one key learning; pharma companies must treat the entire patient not just 'the disease.' Your reputation and your survival depends on it.

KEY POINTS



- Twenty five years ago there was no concept of 'patient-centred behaviours.'
- Patient advocacy activism was necessary to change the attitude of industry towards patients.
- Companies should initiate projects through social channels to keep in touch about patient needs.



REFERENCES

Dreyer NA, Rodriguez AM (2016) The fast route to evidence development for value in health-care. *Current Medical Research and Opinion*, 32(10): 1697-1700

HIV.gov (2016?) A Timeline of HIV/AIDS. Available from hiv.gov/sites/default/files/aidsgov-timeline.pdf

Ledford H (2018) How Facebook and Twitter could be the next disruptive force in clinical trials. *Nature*, 563(7731): 312-315

Sutcliffe E (2018) Patient Centricity Frameworks: A Practitioners Guide. Independent Publication - Industry White Paper.

Topol E (2014) *The Patient Will See You Now: The Future of Medicine is in Your Hands*. New York: Basic Books



HISAM ALAHDAB

CHIEF OPERATING, QUALITY AND SAFETY OFFICER - ANADOLU MEDICAL CENTER, TURKEY

TOP QUOTE FROM THE BLOG:

#IPXSymposium Speaker Spotlight

“There is no doubt that cultural transformation is the major challenge. Moving from a paternalistic, closed and one-directional communication to an open, frank and transparent culture – making partnerships with patients and their families at the centre of care – is the challenge.”

See more at: <https://iii.hm/zqm>



IMMANUEL AZAAD MOONESAR

PRESIDENT-AIB-MENA & ASSISTANT PROFESSOR OF HEALTH POLICY - MOHAMMED BIN RASHID SCHOOL OF GOVERNMENT, DUBAI

TOP QUOTE FROM THE BLOG:

Addressing Overall Expenditures in the U.S. Healthcare

“Cost containment is necessary to maintain the provision of government service levels, particularly in jurisdictions subject to tax limitations. Therefore, it is vital to reduce the need for physician services as a strategy.”

See more at: <https://iii.hm/zqn>



GIRISH SRINIVASAN

CO-FOUNDER & CHIEF TECHNOLOGY OFFICER
TECHNOLOGY SOLUTIONS LEADER / BIO & COMPUTER ENGINEER - PHENOMX, INC PALATINE, USA

TOP QUOTE FROM THE BLOG:

Impact of AI on medical imaging access

“The scarcity of radiologic expertise and resources (hardware, personnel, quality, and other radiology services) impacts up to 4.7 billion people worldwide. Unfortunately, two-thirds of the world's population has no access to basic radiologic services.”

See more at: <https://iii.hm/zqo>



MAJEDA AFEEF AL-RUZZIEH

CHIEF NURSING OFFICER - KING HUSSEIN CANCER CENTER (KHCC), JORDAN

TOP QUOTE FROM THE BLOG:

#IPXSymposium Speaker Spotlight

“I don't think that healthcare leaders are reluctant to use the technology, however the rapid advancement in technology along with the cost associated with the changes represent an issue for some healthcare leaders specially in low- and middle-income countries.”

See more at: <https://iii.hm/zqp>



HealthManagement.org

The Journal

is published by MindByte Communications Ltd

Brussels Office

Rue Villain XIV 53-55
B-1000 Brussels, Belgium
Tel: +32 2 2868500
brussels@mindbyte.eu

Limassol Office

166 Agias Filaxeos
CY-3083 Limassol, Cyprus
Tel: +357 25 822 133
office@mindbyte.eu

Headquarters

9, Vassili Michaelides
CY-3026, Limassol, Cyprus
hq@mindbyte.eu

Executive Team

Christian Marolt,
Executive Director

cm@healthmanagement.org

Iphigenia Papaioanou, Project Director
ip@healthmanagement.org

Anastazia Anastasiou, Creative Director
art1@mindbyte.eu

Editorial Team

Lucie Robson, Editorial Director
lr@healthmanagement.org

Samna Ghani, Senior Editor
sg@healthmanagement.org

Maria Maglyovanna, Staff Editor
vk@healthmanagement.org

Marianna Keen, Staff Editor
mk@healthmanagement.org

Dran Coronado, Staff Editor
dc@healthmanagement.org

Communications Team

Katya Mitreva, Communications Director
km@healthmanagement.org

Maria Christodoulidou, Communications Manager
mc@healthmanagement.org

Uttam Sah Gond, Communications Assistant
ug@healthmanagement.org

Subscription Rates:

6 Issues/one year: Euro 106 + 5% VAT,
if applicable

12 Issues/ two years: Euro 184 + 5% VAT,
if applicable

Production & Printing

Total classic and digital circulation: 60,000

ISSN = 1377-7629a

Printed in Hungary by ABEL Printing, Budapest

© HealthManagement.org is published six times per year. The Publisher is to be notified of any cancellations six weeks before the end of the subscription. The reproduction of (parts of) articles is prohibited without the consent of the Publisher. The Publisher does not accept any liability for unsolicited material. The Publisher retains the right to republish all contributions and submitted materials via the internet and other media.

Legal Disclaimer

The Publishers, Editor-in-Chief, Editorial Board, Ambassadors and Editors make every effort to ensure that no inaccurate or misleading data, opinion or statement appears in this publication. All data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Therefore the Publishers, Editor-in-Chief, Editorial Board, Ambassadors and Editors and their respective employees accept no liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

Verified Circulation

According to the standards of International Business Press Audits.

HealthManagement

is independently audited by TopPro Audit





HealthManagement.org
Volume 19 • Issue 1 • 2019

- 1 Unblock the chain**
Christian Lovis, University Hospitals of Geneva, Switzerland
- 8 Integrating labs into clinical care pathways**
David C. Humphreys, Economist Intelligence Unit, USA
- 10 The essential truth**
Interview with Edzard Ernst, University of Exeter, UK
- 14 Digitizing Healthcare**
Zisis Sotiriou, Affidea
- 16 How to analyse past professional experience for future success**
Michael R. Virardi, Cyprus
- 18 Is Blockchain the right technology for healthcare?**
HealthManagement.org spoke to four blockchain experts for their views
- 20 How Blockchain will transform healthcare**
Alex Cahana, Medtech and Healthcare, USA
- 22 Who stands to benefit from healthcare Blockchain?**
Alexis Normand, Embleema Blockchain for Health Consortium, USA
- 24 Blockchain solves healthcare data obstacles**
Eberhard Scheuer, HIT Foundation, Switzerland
- 28 Is Blockchain impacting the healthcare arena?**
Joe Van De Graaff, KLAS Research, USA
- 31 Can Blockchain support advance in radiology?**
Maria Marengo, Sweden/Nordic Chapter – Government Blockchain Association, Sweden
- 33 Can Blockchain change the healthcare ecosystem?**
Kohei Kurihara, Tokyo Chapter – Government Blockchain Association, Japan
- 38 Blockchain for radiology**
Bhargav Ramanradiologist, Krithika Chandrasekaran, Medpixels Inc., USA
- 42 Blockchain and GDPR compliance for the healthcare industry**
David Manset, Be-Studys (Almerys group), Switzerland; Laura Bernal, Be-Studys (Almerys group), Paris, France; Mirko Koscinaresearch, Octavio Perez Kempner, Be-Studys (Almerys group), Clermont-Ferrand, France
- 45 Healthcare 2019: the year of the Big Data Blockchain**
Frank Ricotta, BurstIQ, USA
Robert Laidlaw, Image Chain, Australia
- 48 How can automation improve outpatient care while reducing costs?**
Francesca MacVean, Gareth Fitzgerald, PAConsulting, UK
- 50 Patient responsibility for following up on test result**
ECRI Institute, UK
- 52 Better outcomes through clinical decision support**
Dr. Peter Thoraus, MVZ Cottbus, Germany
- 55 Encouraging health app use with seniors**
Eva Gattnar, proVITALcoach, Germany

- 59 A patient's journey is likely to include surfing the web: how can we help?**
Christina Athanasopoulou, Medicine University of Turku, Finland; Christos Lionis, Medicine University of Crete, Greece; Maritta Välimäki, Medicine University of Turku, Finland
- 62 Patient safety culture**
Luís Ribeiro, Anabela Ribeiro, Kevin Azevedo, António Abrantes, University of Algarve, Portugal
- 66 A multimodal system for the diagnosis of breast cancer: the SOLUS project**
Paola Taroni, Politecnico di Milano, Italy; Peter Gordebeke, European Institute for Biomedical Imaging Research, Austria; Alberto Dalla Mora, Alberto Tosi, Antonio Pifferi, Politecnico di Milano, Italy; Jean-Marc Dinten, Mathieu Perriollat, CEA-LETI, France; David Savery, Hélène Sportouche, SuperSonic Imagine, France; Bogdan Rosinski, VERMON, France; Simon Arridge, University College London, UK; Andrea Giudice, Simone Tisare, Micro Photon Devices, Italy; Elena Venturini, San Raffaele Hospital, Italy; Pietro Panizza, San Raffaele University Hospital, Italy; Pamela Zolda, European Institute for Biomedical Imaging Research, Austria; Ing. Alexander Flocke, iC-Haus GmbH, Germany
- 70 The evolution of left ventricular assist devices**
Maria Papathanasiou, Peter Luedike, University Hospital Essen, Germany
- 73 Transforming lives a drone delivery at a time**
Claudette Irere, Ministry of Information Technology and Communications, Rwanda; Aline Kabbatende, Rwanda
- 76 Heat Waves: a climate change challenge to hospitals' resilience**
Simona Agger Ganassi, Policlinico Universitario, Italy
- 80 I-I-I Blog**
Michael A.E. Ramsay, Baylor University Medical Center, USA; Karim Boussebaa, Philips, USA; Matthew Gierc, 3AG Systems, Canada; Daniela Pedrini, International Federation of Healthcare Engineering

HealthManagement.org
Volume 19 • Issue 2 • 2019

- 81 Artificial hype**
Lluís Donoso-Bach, Spain
- 90 NYC Go Red for Women movement: STEM Goes Red**
Chelsea Beecher, USA
- 94 Trust-abundant team principles**
Erin E. Sullivan, USA
- 96 Understanding bad communication**
Marianna Keen, Cyprus
- 100 AI is the new reality: the 4th healthcare revolution in medicine**
Ian A. Weissman, USA
- 104 Artificial Intelligence in healthcare: What is versus what will be**
Robert Pearl, USA
- 108 Will AI lead to job cuts or will the tech improve working lives?**
Luciano Floridi, UK, Christian Lovis, Switzerland, Rafael Vidal-Perez, Spain, María Jesús Díaz, Spain
- 110 AI opportunities for healthcare must not be wasted**
Luciano Floridi, UK
- 112 Why embracing Artificial Intelligence is beneficial for all**
Tracy Accardi, Hologic
- 114 AI-based prediction in clinical settings: can we trust it?**
Werner Leodolter, Austria
- 116 Can machines behave morally enough for healthcare?**
Mathias Goyen, GE Healthcare
- 118 Artificial Intelligence: a next way forward for healthcare**
Richard Corbridge, UK
- 121 AI in medical imaging may make the biggest impact in healthcare**
Margaretta Colangelo, USA, Dmitry Kaminskiy, UK
- 126 Operationalising AI in radiology**
Rowland Illing, Affidea
- 128 Future of ultrasound: where are we going?**
Paul Sidhu, UK
- 148 The AI-powered radiologist**
María Jesús Díaz Candamio, Spain
- 154 Clinical ultrasound in the age of artificial intelligence**
Daniel A. Lichtenstein, France
- 157 AI applications in breast imaging**
Jonas Teuwen, Nikita Moriakov, Ritse Mann, The Netherlands
- 162 Value-based healthcare and the doctor-patient relationship**
Marina Gafanovich, USA
- 164 Nursing on the move: cross border hiring**
Iris Meyenburg-Altward, Germany
- 167 How following steps for quality impact healthcare consumerism**
Patience Fagbenro, Canada
- 170 The "One Stick Standard" for vascular access**
Nidhi Nikhani, USA
- 173 Revitalising the aged heart through spermidine-rich diet**
Mahmoud Abdellatif, Simon Sedej, Austria
- 176 State-of-the-art syncope assessment**
Jürgen Fortin, CNSystems
- 178 The role of social media in cardiology**
Vass Vassiliou, UK
- 180 Critical analysis of MRI-based classification systems for sport muscle injuries**
Jaime Isern-Kebeschull, Sandra Mechó, Ricard Pruna, Xavier Yanguas, Xavier Valle, Xavier Alomar, Jaume Pomes, Javier Martinez, Gill Rodas, Spain
- 188 Achieving zero avoidable patient deaths by 2020**
Kevin McQueen, USA
- 193 Innovation in paediatric rehabilitation**
Maurit Beerli, Eliezer Be'eri, Israel

- 196 I-I-I BLOG**
Philip Braham, Remedium Partners, UK
Alex Cahana, Medtech and Healthcare, USA
Nick Adkins, #pinksocks, USA
Dennis Spaeth, CTE Publications, USA

SPECIAL SUPPLEMENT

- III Unleashing the full potential of AI**
- IV One of the largest AI platforms in healthcare is one you've never heard of until now**
- VI How do you serve more patients without adding staff or beds? Here's one hospital's answer**
- IX Analytics in the real world: How one radiology practice is helping patients get an MR exam, faster**
- XI This cardiac software originating from a Stanford basement is now one of the top of Artificial Intelligence solutions available**
- XIV The immunotherapy hurdle – and why doctors could soon predict how each patient will respond**

HealthManagement.org
Volume 19 • Issue 3 • 2019

- 197 Top target treatments**
Federico Lega, Bocconi University, Italy
- 204 EUROSON 2019 welcomes world of ultrasound**
Interview with Prof. Paul Sidhu, King's College Hospital, UK
- 208 BREXIT means BREXIT: radiologists without borders**
Interview with Prof. Vassilios Papalois, The European Union of Medical Specialists, Belgium
- 212 Fighting cyber threats with a global community**
Interview with Denise Anderson, Health Information Sharing and Analysis Center, USA
- 214 Innovation and collaboration: FT Digital Health Summit**
The impact of digital technologies, devices and applications, and the data they produce on patient care.
- 216 World-class healthcare communication practices**
Lions Health focuses on the creation, conception and execution of creativity that has a verifiable impact on healthcare outcomes.
- 218 When does striking out alone works best?**
Dimis Michaelides, Cyprus
- 222 Value-oriented management**
Wilfried von Eiff, University of Muenster, Germany
- 230 Sex and gender in medicine**
Nimisha KumarIndiana, University School of Medicine, USA; Theresa Rohr-Kirchgraber, IU National Center of Excellence in Women's Health, USA.
- 234 Precision health and population health: can they intersect effectively?**
HealthManagement.org spoke to four precision medicine experts for their views.
- 236 Personalised medicine: the road ahead**
Daryl Pritchard, Personalised Medicine Coalition, USA

- 238 **A human-centric approach for data collection**
Ilkka Räsänen, Jaana Sinipuro, Finnish Innovation Fund Sitra, Finland
- 242 **Know more, treat better**
Katia Katsari, Affidea
- 244 **Enhancing precision medicine: sharing and reusing data**
Carlos Luis Parra-Calderón, Institute of Biomedicine, Spain
- 246 **Personalised medicine and cardiovascular disease**
Divyesh Mundra, TISS School of Health Systems Studies, India
- 249 **Telehealth bringing personalised medicine closer**
Lisa Alderson, Genome Medical, USA
- 252 **A primer on next-generation sequencing data analytics**
Shelly Mahajan, CARINGdx, Mahajan Imaging, India; Vidur Mahajan, CARING, Mahajan Imaging, India
- 254 **Leveraging advanced methods to evaluate AI-Pharma companies**
Margaretta Colangelo, Deep Knowledge Ventures, USA; Dmitry Kaminskiy, Deep Knowledge Ventures, UK
- 260 **Secrets of innovation success**
Nicolaus Henke, Richard Bartlett, McKinsey & Company, UK
- New hospital policies and procedures required for patient safety**
263 Michael A.E. Ramsay, Baylor University Medical Center, USA
- 267 **People powered health movement for patients**
Leslee J. Thompson, Accreditation Canada & Health Standards Organization, Canada
- 269 **Healthcare and industry partner for tech innovation**
Anna Frejd, Stockholm Science City Foundation, Sweden
- 272 **Nursing on the move: cross border hiring Iris Meyenburg-Altward, Medical**
University Hannover, Germany
- 276 **I-I-I Blog**
Diane Bell, PA consulting, UK; Chris McCahan, International Finance Corporation, U.S.; Gregory A. Garrett, BDO, U.S.; Chelsea Beecher, American Heart & Stroke Association, U.S.
-
- HealthManagement.org
Volume 19 • Issue 4 • 2019
- 277 **Monitor Me!**
Tienush Rassaf, Germany
- 284 **Innovation and a Unique Experience at EAHM 2019**
Danny Havenith
- 286 **Reducing Risks and Generating Economic Benefits**
Dr. med. Lydia Unger-Hunt, Austria
- 288 **Transforming Colorectal Surgery Outcomes**
Dr. Gerrit Slooter, The Netherlands
- 289 **Hypertension – Prevention is Better Than Cure**
Dr. Jürgen Fortin, Austria
- 290 **Better Insight*, Better Peace of Mind**
Katia Katsari, Hungary
- 292 **The Future of Cardiovascular Disease Treatment and Management**
Arthur M. Feldman, USA
- 295 **A Value-Based Approach to Atrial Fibrillation**
Dr. Erik Kongsgård, Norway
- 296 **Educating Physicians to be Leaders**
Erin E. Sullivan, USA
- 300 **Finance, Skills Gap, Governance: Addressing CIO Challenges**
Sarah Moorhead and Rich Corbridge, UK
- 302 **Nurses and Cutting Edge Technology**
Iris Meyenburg-Altward, Germany
- 306 **The Hospital as a Brand**
Maximilian C. von Eiff, Wilfried von Eiff, Germany
- 311 **Lions Health 2019: Creativity and Innovation in Healthcare**
- 314 **Consumer Tech Promotes Patient Engagement**
Adam Cherrington, USA
- 316 **Patient Trust Needed for Healthcare Data Success**
Joan Guanyabens, Spain
- 320 **Cardiology and mHealth – Rethink About Monitoring**
Rafael Vidal-Perez, Spain
- 323 **Sensors in Everyday Objects for Dementia Care**
Thanos G. Stavropoulos, Spiros Nikolopoulos and Ioannis Kompatsiaris, Greece
- 326 **Improving Patient Compliance with Future mHealth**
Inder Davalur, India
- 328 **In Data We Trust**
Jaana Sinipuro, Finland, John Bullivant, UK and Marina Gafanovich, USA
- 330 **Cardiovascular Disease Prevention 2019: Quo Vadis?**
Amir A. Mahabadi, Germany
- 332 **Sex and Gender Impacts in Cardiovascular Disease: A “Typical” Presentation of Cardiovascular Disease?**
Kathryn Lindstrom and Theresa Rohr-Kirchgraber, USA
- 335 **Inotropic Agents for Heart Failure – Wishful Thinking?**
Joachim W. Herzig, Germany
- 340 **Nuclear Cardiology: Molecular Insights into the Heart**
Christoph Rischpler, Matthias Totzeck and Ken Herrmann, Germany
- 344 **Putting Medical Radiation Protection First**
Guy Frijia, France
- 347 **Closing the Loop: The Road to Zero Medication Errors**
Nathaniel M. Sims, USA
- 351 **‘The Death of Cancer,’ The Patient Perspective**
Peter Kapitein, The Netherlands
- 353 **#Pinksocks: Changing the World With Heart Speak, Hugs and Gifting**
Nick Adkins, USA
- 356 **III Blog**
Immanuel Azaad Moonesar, UAE; Ariella Shoham, Israel; Michael Johnson-Ellis, UK; Michael D. Catten, USA
-
- HealthManagement.org
Volume 19 • Issue 5 • 2019
- 357 **Turning the Silver Tsunami into a Silver Lining ...**
Alexandre Lourenço, Portugal
- 364 **EUSOBI 2019**
Gabor Forrai, Hungary
- 366 **Vendor-Driven Standards for Interoperability**
David Hancock, UK
- 370 **The Importance of Meaningful Innovation in Healthcare**
Kees Wesdorp, The Netherlands
Chip Truwit, USA
- 374 **Singapore: Transformative Shifts in Healthcare Management**
Eugene Fidelis Soh, Singapore
- 378 **Innovation and Inspiration for Healthcare**
- 380 **Innovative Technologies for Improved Healthcare**
Douglas Franco, USA
- 382 **Improving Patient Experience in the Era of Digitisation**
Zisis Sotiriou, Hungary
-
- HealthManagement.org
Volume 19 • Issue 6 • 2019
- 383 **Innovative Healthcare Strategies**
Pedro Facon, Belgium
- 384 **Brexit: Wreaking Havoc in Healthcare?**
Martina Axmin, Sweden; Mark Dayan, UK; Nick Fahy, UK; Markus Frischut, Austria; Michael Johnson Ellis, UK; Titti Mattsson, Sweden; Vassilios Papalois, UK
- 388 **Leading Change as a Physician**
Xavier Corbella, Spain and Erin E. Sullivan, USA
- 392 **How to Change Fertility are with Value-Based Healthcare**
Max Curfs, The Netherlands
- 394 **Managing the Whole Health of the Ageing Population**
Colin Buckley, USA
- 398 **Opportunities and Risks of Digital Health: Older People’s Perspective**
Estelle Huchet, Belgium
- 400 **Anti-Ageing Therapies: From Basic Science to Human Application**
Mahmoud Abdellatif and Simon Sedej, Austria
- 404 **Ageism in Healthcare: Why It Has To Stop**
Liat Ayalon, Israel
- 406 **Secrets of Longevity The IKARIA Study**
Panagiota Pietri, Greece
- 410 **FrailSafe System: An Innovative Approach on Frailty**
Sotiria Moza, Marina Polycarpou and Stella Nicolaou, Cyprus
- 414 **Game-Changing Meeting of Minds: Radiology and Imaging Informatics**
Erik Ranschaert, Austria
- 418 **Image Information Delivery in the AI Era: Two Likely Scenarios**
Stephen R. Baker, USA
- 420 **The Sex and Gender Influence on Hypertension**
Sheena Shah Pares, Theresa L. Greco and Theresa Rohr-Kirchgraber, USA
- 423 **How the Brain Works: Looking Inside to Target Treatments**
Sarah Muldoon, USA
- 424 **New Management Pathways in Cardiovascular Risk Factors**
Rafael Vidal Perez, Spain
- 426 **Tackling the Five Essential Levers of Theatre Efficiency**
David Thorpe, UK
- 428 **III Blog**
Sabesan Sithamparanathan, UK; Mathias Goyen, Germany; Dennis Spaeth, USA; Jannicke Mellin-Olsen, Norway
-
- HealthManagement.org
Volume 19 • Issue 6 • 2019
- 429 **Editorial**
How healthcare can take control on both macro and micro levels to steer the course towards sustainability
Christian Marolt, Cyprus
- 436 **Alexandre Lourenço: new Healthmanagement.org EXEC Editor-In-Chief**
Alexandre Lourenço, Portugal
- 438 **Leading breast radiologist wins 2019 RSNA accolade**
Fiona Gilbert, UK
- 440 **The future of cardiovascular medicine – technology, gender bias and treatment strategies**
Mamas A. Mamas, UK
- 444 **2020: another year of radical change in healthcare**
The Editors-in-Chief for HealthManagement.org shared their views on what to look out for in 2020



- 446 Creating the Dream Team in radiology**
Luis Martí-Bonmati, Hospital Universitario y Politécnico, Spain
- 448 How to integrate AI into radiology workflow**
Bram van Ginneken, Radboud University Medical Centre, The Netherlands
- 450 Beyond imaging, towards a care pathway approach powered by AI**
Giuseppe Recchi, CEO, Affidea
- 452 Multisociety AI radiology ethics framework announced**
Leading radiological societies issue a statement on a new ethical framework.
- 454 Bridging the radiologist staffing gap with new training initiative**
Caroline Rubin, Royal College of Radiologists, UK
- 456 Cultivating innovation cultures in healthcare**
Dimis Michaelides, Cyprus
- 458 The importance of body language**
Annemiek Nootboom, Nootboom Consult, The Netherlands
- 460 Measuring the nation's health**
Christian Norris, Harry Dunsford, PA Consulting, UK
- 462 Resilience: the airbag for nurses and other healthcare professions**
Iris Meyenburg-Altward, Medical University Hannover, Germany
- 466 Measuring healthcare outcomes to deliver value and lower costs**
Robert S Kaplan, Michael S. Porter, Harvard Business School, USA
- 468 Revenue cycle management**
Boyd Steward, KLAS Research, USA
- 471 Use patient safety to improve your bottom line**
David B. Mayer, Patient Safety Movement Foundation, USA
- 472 Delivering high-value imaging: a paradigm shift from efficiency to effectiveness**
Yoshimi Anzai, University of Utah, USA
- 476 Public-private partnerships: a win-win for Danish healthcare and for the industry**
Hans Erik Henriksen, Healthcare DENMARK, Denmark
- 480 Disruption is coming to healthcare**
Robert Pearl, Stanford University Graduate School of Business and School of Medicine, USA
- 484 Healthcare data: creating a learning healthcare ecosystem**
Elia Stupka, Health Catalyst, USA
- 489 Digital transformation for more effective healthcare: inspiring VBHC initiatives**
Fred van Eenennaam, Lena van Selm, Marlou Smits, VBHC Center Europe, The Netherlands
- 492 Closing the cycle of research, prevention, diagnosis, monitoring and treatment with a simple finger sensor**
Walter Habenbacher, CNSystems
- 494 Medical image exchange in the cloud: a more efficient way**
Miguel Cabrer, Idonia Medical Exchange, Spain
- 498 The role of EIT Health in training the European future workforce**
Annick Ducher, Ursula Mühle, EIT Health, Germany
- 502 The ABC of patient engagement: breathe new life into old stories**
Emma Sutcliffe, NexGen Healthcare Communications, UK
- 506 I-I-I Blog**
Hisam Alahdab, Anadolu Medical Center, Turkey; Immanuel Azaad Moonesar, Mohammed Bin Rashid School of Government, UAE; Majeda Afeef Al-Ruzzieh, King Hussein Cancer Center, Jordan; Girish Srinivasan, PhenoMx Inc, USA

IMPROVE CARE,
CUT COSTS
AND INCREASE
PATIENT
SAFETY WITH
ULTRASOUND



See the benefits and evidence for incorporating point-of-care ultrasound into 12 common procedures.

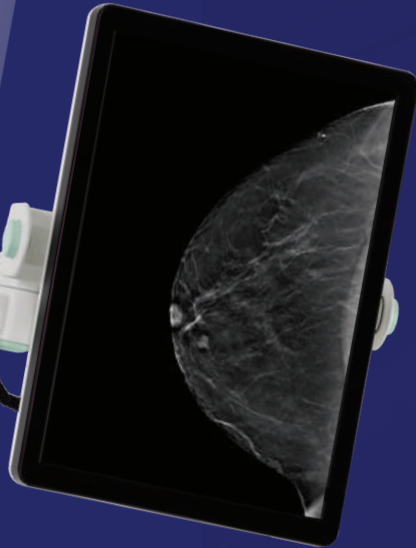
Our **'Patient Safety Guide'** shows how point-of-care ultrasound (POCUS) can impact quality of care, patient safety, healthcare costs, and patient satisfaction. Scan the QR code below to download the guide and learn about ultrasound for 12 of the most common invasive procedures.



Scan the QR code to download
the **'Patient Safety Guide'**



Clarity HD Technology



Intelligent 2D™ Imaging Technology



The clear choice, from every angle.

Clarity HD High-Resolution 3D™ Imaging

- The fastest and highest resolution images in the industry with the same 70 micron pixel size as Hologic FFDM.^{1,2}
- Cutting-edge detector technology and advanced 3D™ algorithm deliver exceptional 3D™ images for women of ALL breast sizes and densities.
- Designed to clearly see subtle lesions and fine calcifications to help detect cancers early

Intelligent 2D™ Imaging Technology

- A low dose solution for the only 3D™ mammogram™ clinically proven to detect up to 65% more invasive breast cancers compared to 2D alone.³
- Generates a new, natural looking 2D image using advanced algorithms and high-resolution 3D™ data.
- Accelerates lesion detection and assessment of microcalcifications, as well as spiculated, round and other soft lesions.²

Learn more at 3DimensionsSystem.com

1. Rafferty EA, Durand MA, Conant EF, et al. Breast cancer screening using tomosynthesis and digital mammography in dense and non-dense breasts. JAMA. 2016 Apr 26;315(16):1784-6. 2. Hologic FDA approved submissions files P080003, P080003/S001, P080003/S004, P080003/S005 3. Friedewald, SM, et al. "Breast cancer screening using tomosynthesis in combination with digital mammography." JAMA 311.24 (2014): 2499-2507 ADS-02416-EUR-EN Rev 001 © 2018 Hologic, Inc. All rights reserved. Hologic, 3D, 3Dimensions, 3D Mammography, Clarity HD, Dimensions, Selenia, Intelligent 2D, The Science of Sure, and associated logos are trademarks and/or registered trademarks of Hologic, Inc. and/or its subsidiaries in the US and/or other countries. All other trademarks, registered trademarks, and product names are the property of their respective owners.