International Congress

eHealth in Revolution

with special reference to Cardiology

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ABSTRACT BOOK

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eHealth: where we are now?

Josip Car
Director of Global eHealth Unit, Imperial College London

Information and communication technologies (ICT) have transformed virtually every dimension of human enterprise. eHealth has held great promise for human health. As stated in World Health Assembly (WHA) Resolution 66.24 on eHealth standardization and interoperability (2013) "…It is essential to make appropriate use of information and communication technologies in order to improve care, to increase the level of engagement of patients in their own care, as appropriate, to offer quality health services, to support sustainable financing of health care systems, and to promote universal access."

Yet the potential of ICT to advance and support global health is yet to be fully realised. There is evidence of benefit of ICT in developed countries, and growing evidence in low and middle-income countries. But there are also a number of government reports in high income countries describing billions of dollars lost in failed national eHealth schemes.

A person-driven and person-centric view of eHealth needs to be advanced which is able to adopt life course, disease burden and level of care approaches, and addresses key challenges faced by healthy populations, patients and health systems in preventive health care, and in the management of acute and long-term conditions. The ability of eHealth to improve health and access to healthcare could only be met by focussing on interrelated, intertwined and interdependent eHealth functions centred on a person/patient sup-

porting their health management by communication between patients/peers and healthcare professionals, learning and sharing information by ICT, effective data collection, and supporting decision making and self-management.

There is an urgent need to see through the hype in order to properly capitalise on the potential of ICT to realise the vision of the WHA, and to meet the health and universal healthcare access goals of the SDG and World Bank. To understand what eHealth could achieve for improved health and healthcare by 2030, and determine what needs to be done in order to make it happen.

Digital, the spark that starts the eHealth revolution

Richard Corbridge
Chief Information Officer, Health Service Executive, Ireland

Fran Thompson
Programme Director, Health Service Executive, Ireland

The position of eHealth in Ireland in January 2015 was an arena that had poor investment to date; it had delivered functionality and support in local pockets of excellence but had not been able to consider the national perspective of healthcare delivery. The ability for Ireland's health system to be reformed through the implementation of a digital ambition has become a tangible possibility and in the last 18 months huge efforts have been made to ensure the delivery of eHealth in Ireland. A national Electronic Health Record (EHR) has been identified as a key capability requirement for the future delivery of healthcare. While technology solutions are a key component, there will be a primary focus on how clinicians and administrative staff work with this technology in a way that closely aligns with and underpins the ambition for Integrated Care and other national healthcare reform priorities. eHealth Ireland's ambition is to put in place the digital fabric for eHealth in Ireland by 2020; that is not to say to complete a full overhaul of every system but to set the system on its way to a constant digital evolution.

The new European data protection regulation - Impact on health data

Rob Corbet
Head of Technology & Innovation, Arthur Cox

"On 25 May 2018, the 1995 European Directive governing data protection in the European Union will finally be replaced by a comprehensive EU General Data Protection Regulation. The Regulation will have particular impact for the health sector as it significantly extends existing concepts such as consent and transparency while also introducing new concepts. For example, the GDPR will introduce rules specifically governing health "profiling" the use of biometric data and genetic data while introducing new rights in the hands of individuals such as the "right to be forgotten" and the right to data portability. The new law will be underpinned by radical enforcement measures with the capacity for Data Protection Supervisory Authorities to impose enormous administrative fines while providing individuals with the possibility of recovering compensation on a civil basis, even for non-material breaches. In this short presentation, Rob Corbet will walk through the key provisions within the GDPR so as to assist you in preparing for the impact of the GDPR in the health sector."

Heart failure virtual consult

Ciara Keane
The Heartbeat Trust

The Heartbeat Trust was founded by Prof Ken McDonald and Dr Mark Ledwidge as a research and clinical service provision body for the prevention and treatment of heart failure. Over a 17-year period an internationally recognised service has been developed for the diagnosis and multidisciplinary management of heart failure. Our landmark international study (STOP-HF) on the prevention of heart failure has featured heavily in the USA and internationally, leading to significant improvements in survival and the prevention of heart failure and cardiovascular disease. There are strong links with a number of bodies in the USA such as the Mayo and Cleveland Clinic whom we work closely with as well as research and clinical bodies in Europe.

The Trust builds unique collaborations between hospitals, community care, healthcare professionals and patients for the benefit and ease of patient care. For the past 18 months the Trust have been developing a virtual consultation service for family physicians and specialists to collaboratively care for patients with heart failure. The virtual clinic helps to address some of the health care system's most intractable problems, including inadequate or disparities in access to care, rising costs, systemic inefficiencies, and unequal or slow diffusion of best practices.
The virtual consult has lead to a reduction in the need for hospital attendance (approx. 80% reduction), speedier specialist opinion and reduced need for travel for patients and their families. The Trust has partnered with the inter-

nationally leading Project ECHO (Extension for Community Healthcare Outcomes), a collaborative model of medical education and care management that empowers clinicians everywhere to provide better care to more people in the community.

The potential of the heart failure virtual clinic to exponentially expand workforce capacity to treat more patients sooner, using existing resources is now being recognised. At a time when the health care system is under mounting pressure to do more without spending more, this is critical.

Towards data enhanced primary mental healthcare

Walter Cullen
Department of General Practice, University College Dublin

Mental health problems are an important issue for population health. They are common, associated with significant morbidity and mortality and have a profound impact on individual people's lives. The use of large datasets offers considerable potential to help practitioners better understand the epidemiology, natural history, diagnosis and treatment of these conditions, but challenges exist. This paper aims to examine how large datasets can enhance our understanding of mental health problems in primary care. The paper will systematically review the literature on the prevalence of mental health disorders attending primary care, describe the development of an electronic tool to identify patients with known mental health diagnoses, examine its use in real-world general practice, reflect on its challenges and make recommendations for how this approach can enhance population health, by facilitating interventions to enhance patient care. Given that the majority of patients who experience mental health problems, have these problems identified and treated within primary care, this is a priority area for future research and development.

Using eHealth to create a peer support network

Sean Higgins
AMI Ltd

How can a Primary Care Group Email service evolve into a fully-fledged secure mobile messaging app that now helps deliver improvements and efficiencies in patient care?
9 Months ago we began development of a new National GP Forum application to replace the existing email based system used over the past 4 years by over 500 GP's. Inspired by open source imaging technology and other secure messaging and live posting applications we developed and deployed a new application physicians may now use on both mobile and desktop. A typical GP user spends on average 23mins per day on our application which has now developed into a peer to peer support network for practicing GPs. Questions related to referrals, clinical queries and practice management are posted and debated daily. Although forums are far from 'new tech' we have found that combination of features we've evolved with the security of a closed community has encouraged physicians to engage and interact much more openly than other physician networks. A culture of openness where any question may be asked and answered within minutes has already begun to facilitate improvements in patient care. Over the next 6 months we intend to provide similar networks to other healthcare groups and we also will allow embedding of our network within existing EHR platforms.

eHealth in Respiratory Disease

Seamas Donnelly
Respiratory Medicine, Trinity College Dublin

Chronic respiratory diseases and in particular asthma and chronic obstructive pulmonary disease (COPD) represent the archetypical diseases where the eHealth revolution will change the way we practice medicine.
These diseases represent a significant financial and emotional burden for patients, their families and healthcare providers. They account for over $88 billion in expenditure for both direct and indirect costs annually in the United States.
In this talk we will illustrate three clinical vignettes where eHealth offers to improve patient care in a cost-containment health economic environemnt. These illustrations identify current clinical unmet needs and how utilisation of novel technologies combined with advanced data mining and integration techniques will address them. These illustrations include :

- Inhaler treatment compliance
- Precision Medicine and getting the right treatment to the right patient
- Predicting early clinical exacerbations in chronic respiratory disease

The incorporation of eHealth solutions in respiratory disease will engage and empower patients to better self-management of their disease and well being. It will reset the pendulum of medical care from a current hospital-centric reactive model to a proactive community absed approach.

eHealth for the Real World

Avril Copeland
Tickerfit

Digital health technologies encompass a wide variety of tools such as mobile applications, wearable sensors and portable diagnostic equipment. Digital health has the potential to support and engage patients manage their own conditions, support quicker, safer decision making and close the communication gaps between users. Despite the benefits and potential, digital healthcare is still in its infancy, and as a result, the path to wide scale adoption is still being paved. Chartered physiotherapist, now founder/CEO of digital healthcare company TickerFit, Avril Copeland will present her journey from ideation to adoption; the trials and tribulations.

VOCAL: Virtual Online Consultations - Advantages and limitations

Joseph Wherton
Nuffield dept. of primary care Health Sciences, University of Oxford

Remote video consultations between clinician and patient are technically possible and increasingly acceptable. Technologies that support alternatives to face-to-face consulting are seen by policymakers as potentially improving the financial efficiency as well as the clinical effectiveness of services. At present there are a number of communication tools, such as Skype, available to clinicians that could provide an effective way of managing a patient's condition, not least because it makes access to health care professionals less practically demanding. However, it is important to understand how the dynamic in a consultation can change if carried out via Skype as opposed to in office, as well the variables may mediate that change. We also need to understand how such tools influence and relate to organisational systems and processes so that they can be appropriately embedded and sustained within routine care practice. The VOCAL study aims to define good practice and inform its implementation in relation to clinician-patient consultations via Skype and similar virtual media. The project is based in two contrasting clinical departments (Diabetes and Cancer Surgery). The research consists of a series of in-depth qualitative studies of interpersonal interaction via Skype (micro-level) embedded in an organisational case study (meso-level) with key informant interviews at national policy level (macro-level). This presentation will cover some preliminary findings on the experience of using video-mediated communication for remote consulting and the key challenges to implementation and use of such technology within clinical settings.

Challenges and opportunities in eHealth clinical research

Evan Muse
Scripps Institute, San Diego

Through parallel advances in portable computing power and wireless connectivity there has been an explosion of mobile wellness and medical apps and devices. Covering nearly every organ system there are sensors allowing for advanced physiologic monitoring for the prevention and management of disease. These technologies can empower patients, increase access to health care in underserved communities and potentially reduce overall healthcare spending. While the number of entities in the eHealth space has grown steadily, the amount of high quality evidence guiding the appropriate use of these novel sensing modalities remains low. Thus, despite great enthusiasm by patients and providers and remarkable achievements in device and app development many questions remain. In an effort to narrow the gap that exists between the promise of these advancing technologies and the meaningful data driving improved clinical outcomes, research in this area has also had to advance and adapt - rethinking and reshaping some of the most basic concepts of traditional clinical trials. Through effectively addressing the challenges in clinical research posed by novel medical technologies many exciting opportunities for study can be recognized.

Experiences of a medical entrepreneur

Johnny Walker
Health Founders

Never before has there been a more compelling time and a more urgent need to disrupt and transform the way we deliver healthcare to the people of our planet. The traditional healthcare system is simply unsustainable despite the phenomenal efforts of everyone within the ecosystem in putting their shoulder to the wheel. We deeply believe that at least part of the solution lies in harnessing the potential of "exponential technologies" through the power of "exponential thinking". Our whole focus has got to change from a traditional hospital-based doctor-focused solution. We want to leverage health informatics and simple smart technologies to create compelling, personalised, digital and mobile solutions for all stakeholders of the wider ecosystem. We are focused on empowering the individual and all who care for them to take ownership of their personal well-being from the palm of their hand from the sanctity of their home.

From masters project to global oncology brand

Eoin O'Carroll
Portable Medical Technologies

Eoin O'Carroll co-founder of Portable Medical Technology Ltd. will outline then company's journey to create a mobile application for oncology healthcare professionals. Starting as a masters project, they progressed to getting their decision support tool ONCOassist, to be the 1st Irish app to be classified as a medical device, endorsed by major oncology associations and to a position where it is now getting recognition as a global oncology brand.

The mobile health environment has evolved in Ireland and Europe at a pace that has frustrated many a startup including Portable Medical Technology Ltd. but persistence and hard work will prevail. Struggling initially with market adoption and the correct business model, ONCOassist found it hard to find its place in the market. It decided to engage with its user base, particularly early adopters through feedback via surveys, pilots and in person meetings. This user feedback was the driving force to grow the company to its position today.

Engaging patients and the public in digital health: Findings from a systematic review of qualitative studies

Siobhan O'Connor
University of Manchester

Background: Numerous types of digital health interventions are available to patients and the public but many factors affect their ability to engage and enrol in them. This systematic review aims to rigorously identify and synthesise the qualitative literature on barriers and facilitators to engagement and recruitment to digital health interventions to inform future implementation efforts.

Methods: Six online bibliographical databases; PubMed, MEDLINE, CINAHL, Embase, Scopus and the ACM Digital Library, were searched for English language qualitative studies from 2000 – 2015 that discussed factors affecting engagement and enrolment in a range of digital health interventions such as 'telemedicine', 'mobile applications', 'personal health record', 'social networking'. Text mining and additional search strategies were used to identify 1,448 records. Two reviewers independently carried out paper screening, quality assessment, data extraction and analysis. Data was analysed thematically using framework synthesis, informed by Normalization Process Theory.

Results: Nineteen publications were included in the review. Four overarching themes that affect patients and the publics' ability to engage with and sign up to DHIs emerged; 1) personal agency and motivation; 2) personal life and values; 3) the engagement and recruitment approach; and 4) the quality of the DHI. The review also summarises the engagement and recruitment strategies

used. A preliminary Digital Health Engagement Framework (DHEF) was developed to bring all the processes involved to light and provide a detailed understanding of factors affecting engagement and enrolment. Existing knowledge gaps and developments underway to address these are identified and suggestions made for future work in this area. Study limitations include English language publications and exclusion of grey literature.

Conclusion This review comprehensively summarises and highlights the complexity of digital health engagement and recruitment processes and reiterates the myriad of issues that need to be addressed before patients and the public commit to digital health and it can be implemented effectively. More work is needed to create successful engagement strategies and better quality digital solutions that are personalised where possible and to gain clinical accreditation and endorsement when appropriate. More investment is also required to improve computer literacy and ensure technologies are accessible and affordable for those who wish to sign up to them.

Developing eHealth Systems for Mental Health in Scotland

Mark Fleming
eHealth Scotland

In his session Mark will present on his clinical nursing role within the development and implementation of a clinical information system within his NHS Board in Scotland.
He will define the frameworks used for referral management, patient workflow, clinical assessment and risk management, care planning and review as well as care pathway monitoring.
He will also explain how Nurses across Scotland are working together to develop and support the implementation of the eHealth strategy across Scotland.
He will explain how their developed network supports clinicians in engaging with the technical leads to ensure that their IT systems are fit for purpose when developed and implemented.

Making smart use of data for better health

Brian Caulfield
University College Dublin INSIGHT Centre

Demographic trends and severe financial pressures in the system are forcing us to re-imagine the way we cater for the health and social care of our society. Thankfully, recent advances in ICT platforms have led to a veritable explosion in our capacity to monitor and digitize human behavior and performance, and use the resultant data to drive new, proactive models of care that facilitate the right decisions to be made in the right place at the right time. It also enables people to become co-producers of their own health journey throughout the lifespan.

However, this increased access to data brings new challenges. Unless we understand how to best harness the potential in the many data streams available to us, we risk becoming overwhelmed by a deluge of data that can make decision making even more difficult than it is today. A key focus of the SFI funded Insight Centre for Data Analytics (www.insight-centre.org) is the application of smart data analytics technologies to healthcare challenges. In this talk we will describe how mobile computing technologies and artificial intelligence techniques are being combined in the Insight Centre to address shortcomings in our current care models for rehabilitation following total joint replacement surgery.

Industry view eHealth solutions

Karl O'Leary
Microsoft

Technology is everywhere. It's integrated into our lives. It's disruptive and it's also catalyzing innovation and growth in business. There's a lot of talk about connected devices or the "Internet of Things," advanced data analytics, machine learning, augmented reality and so on, and everyone is wondering how they can use these technology advances to shape their destiny. This includes the health industry.

The role of industry-academic collaborations in supporting connected health

Michael O'Shea
Applied Research for Connected Health, University College Dublin

Current Healthcare models are unsustainable. Every country in the world faces the challenge of infinite demand for healthcare from finite financial and human resources. The incentive behind Connected Health is to develop and deliver patient-centred healthcare solutions, enabled by technology, that can increase quality of life and reduce the risk to patients while lowering the overall cost of care. Maximising the potential of Connected Health requires the involvement of a wide mix of disciplines including social scientists, technologists, product designers, and healthcare providers as well as patients. Industry led collaborative research centres play an important role in ensuring integration of interdisciplinary experts, stimulating open innovation and building knowledge to minimise risk in developing new healthcare solutions. The model is however challenging and finding an alignment between academic, commercial and healthcare motivations is a delicate art.

eHealth: risk or opportunity?

Eugenio Capasso
A. Menarini

Through the usage of examples and statistics, Eugenio Capasso intends to stimulate few thoughts on the fast growing expansion of mobile apps and emerging technologies in the Healthcare Industry.
There are several issues which could impact the quality and the independence of Healthcare from the possible disintermediation of HCPs during the first diagnosis (the so-called "Dr. Google" trend) to the lack of certification on collected Data and the debated issues related to Data Privacy. In addition, the entrance of big Technology Players and the possible new Key Influencers on the web are highlighted as potential factors for a rapid and unpredictable transformation of the Industry.
At the same time, mHealth could also be a great opportunity to dramatically improve the quality of services provided by HCPs by having more data available when needed, by quickly accessing all certified literature, by having intelligent agents supporting the diagnosis and by following patients more closely.
In summary, mHealth is a great opportunity if the potential risks are properly understood and managed with a deep and proactive involvement of HCPs.

Irish advanced primary care as foundation of tomorrows healthcare. "Patient centered medical home"

Paul Grundy
IBM

Objectives
Participant will understand/be able to discuss the important trend of PCMH in delivering patient centered medicine. Participant will understand/be able explore the rationale and supporting evidence for PCMH. Participant will understand/be able understand the impact on patients, providers and payers

In the next 10 years, we will be living in 1) mobile world 2) in the middle of an aging and chronic disease epidemic and 3) data. But , we will also have the ability to analyze data in a cognitive way this will do for doctors' minds what X-ray and medical imaging have done for their vision. How? By turning data into actionable information. We need the basic foundation to support this transformation a system integrator where data at the level of a patients flows and is held accountable and that model is the Patient Centered Medical Home. (PCMH) starts to happen when clinicians/ healers step up to comprehensive relationship based care empowered by tools to manage the data and communicate effectively. This move to PCMH level care requires the discipline of leading a team that delivers population health management, patent centered prevention, care that is coordination, comprehensive accessible 24/7 and integrated across a deliver system and all of that is power by data made into meaningful information. But at its core it is a move toward integration of a healing relationship in primary care and population management all at the point of care with the tools to do just that.

A Patient Centered Medical Home (PCMH) happens when primary care healers keeping that core healing relationship with their patients step up to become specialists in Family and Community Medicine. The move is to the discipline of leading a team that delivers population health management, patent centered prevention, care that is coordination, comprehensive accessible 24/7 and integrated across a deliver system. PCMH happens when the specialists in Family and Community Medicine wake up every morning and ask the question WITH DATA how will my team improve the health of my community today?

eHealth in LMICs: current state of the art and future directions

Nikolas Mastellos
Global eHealth Unit, School of Public Health, Imperial College London

Health systems in low- and middle-income countries (LMICs) are facing considerable challenges in providing affordable and accessible care mainly due to financial and geographic barriers. This has led those involved in the planning and delivery of care explore the application of information and communication technology for health (eHealth) in LMICs. While eHealth technologies, such as electronic medical records, are not widely available in LMICs, mobile health solutions are becoming increasingly available due to the unprecedented increase in mobile phone ownership and network coverage over the last decade. However, despite the large amount of current mobile health programmes, most projects fail to scale up. This session will discuss the current landscape of eHealth projects in LMICs, the challenges to implementation and sustainability, the future of eHealth in resource-poor settings, and lessons learnt for high-income countries.

Closing Lecture: future of e-health. Role of biomarkers

Alan Maisel
University of California, San Diego

Biomarkers may play a very important part in the future of E-Health. Already there are many Transgenomic Pharmogenic Services that offer companion diagnostics. The best biomarkers may proteins because they are inexpensive, reliable surrogates that can be measured at the point of care. The natriuretic peptides are the standard diagnostic for heart failure diagnosis and decompensation, and in the future may also lead to prevention of heart failure by screening. Now that tropoinin assays are of high sensitivity, they can usually rule out a MI in two hours or less, when values are above the 99 th percentile. At least half of normal people have troponin levels that can be measured and in some cases these can be used to monitor the development and progression of disease. Finally sST2 is biomarker that depicts a pro-fibrotic state and as a point of care measurement may allow us to diagnose early left ventricular dysfunction.

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