



International
Hospital
Federation

World Hospitals and Health Services

The Official Journal of the International Hospital Federation

Virtual health: the next frontier for care

- I HIMSS Venture+ Forum and HX360 Provide Industry View of Health Technology Innovation, Startup and Investment Activity; Advancing the New Model of Care
- I Facilitating Virtual Health Management Using Medical Device Integration
- I Hospitals will send an integrated nurse home with each discharge
- I Rethinking online health information: How about personalization?
- I No turning back – prospects and challenges of eHealth
- I If these walls could talk: utilizing health data from the home to reduce unnecessary readmissions
- I Grasping the health horizon: toward a virtual, interoperable platform of health innovations
- I Physician Collaboration – Now needed more than ever
- I MASK-rhinitis, a single tool for integrated care pathways in allergic rhinitis

Abstracts: Français, Español, 中文

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2015 IHFCHICAGO

39th World Hospital Congress

October 6-8

The **place** to meet and interact with **key Leaders** that shape national and international **healthcare systems!**

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- Major important innovations in healthcare

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- Carissa Etienne, MD, Director General, Pan American World Health Organization
- Bernard J. Tyson, Chairman & CEO, Kaiser Permanent (USA)
- Maureen Bisognano, President & CEO, Institute for Healthcare Improvement
- Liisa-Maria Voipio-Pulkkinen, MD, PhD, Director Healthcare Group, Ministry of Social Affairs & Health (Finland)
- Claudio Luiz Lottenberg, MD, PhD, President, Hospital Israelita Albert Einstein (Brazil)

Side Events:

The Chicago 2015 Health Venture Fair: Innovation Showcase **October 8, 1 – 8 pm**

Co-Chairs: Alexander Preker (CEO Health Investment & Financing Corp.) – John Casillas (CEO BoardTrust)

Visionary: Fred Bazzoli (Editor in Chief, Health Data Management)

A Vision on Disruptive Innovations

Simon Schurr (CEO, Collaborative Medical Technology Corp.)
Jonathan Weiss (CEO, HealthEngine)

Uncertain as a Competitive Advantage

Richard Frese and Julie Spector (Milliman Consulting)
Francois Millard (The Vitality Group)
James Cercone (Sanigest)

Patient Safety & Infection Control

David MacKay (Vice President, GoJo)
Gianluca Malaguti (CEO 99 Technologie)
Mert Iseri (CEO SwipeSense)
Rob Swayne (President ARC HealthCare Solutions)

06:00 – 8:00 pm Deal making and VIP reception (Networking and Awards Ceremony)

Innovations from Mobile Medical Banking

Tom Furr (PatientPay)
Vineet Gulati (HealthExpense)
Bill Marvin (InstaMed)

C-Suite Executives

Bill Tholl (President and CEO, HealthCare Canada)
Steve Thompson (Senior Vice President, Harvard Partners)
Paula Wilson (President, Joint Commission International)
Szabolcs Dorotovics (President, Mt Sinai International, NY)
Eric de Roodenbeke (Executive Director, IHF)
Paul Dugdale (Chair, Australian Healthcare and Hospitals Assoc)
Hortenzia Beciu (Director, Johns Hopkins Medical International)



2015 IHFCHICAGO
39th World Hospital Congress

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- Quality and safety
- Health care management and leadership opportunities and challenges
- Innovation in healthcare delivery
- Ethical issues

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40 Language abstracts

45 IHF events calendar

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ISSN: 0512-3135

Published by Nexo Corporation
for the International Hospital Federation

Via Palmiro Togliatti 73 A/1, 06073 Corciano (Pg) - ITALY
Telephone: +39 075 69 79 255
Fax: +39 075 96 91 073
Internet: www.nexocorporation.com

Subscription

World Hospitals and Health Services is published quarterly. The annual subscription to non-members for 2015 costs CHF 270 or US\$280 or €250. All subscribers automatically receive a hard copy of the journal, please provide the following information to james.moreno@ihf-fih.org:
-First and Last name of the end user
-e-mail address of the end user

World Hospitals and Health Services is listed in Hospital Literature Index, the single most comprehensive index to English language articles on healthcare policy, planning and administration. The index is produced by the American Hospital Association in co-operation with the National Library of Medicine. Articles published in *World Hospitals and Health Services* are selectively indexed in Health Care Literature Information Network.

The International Hospital Federation (IHF) is an independent non-political and not for profit membership organization promoting better Health for all through well managed and efficient health care facilities delivering safe and high quality to all those that need it. The opinions expressed in this journal are not necessarily those of the International Hospital Federation or Nexo Corporation.

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<http://www.ihf-fih.org/About-IHF/IHF-Executive-Committee-and-Governing-Council>

IHF Newsletter is available in <http://www.ihf-fih.org/IHF-Newsletters>

World Hospital Congress - Chicago 2015

Concurrent Sessions

Tuesday, Oct. 6, 1:30 p.m.-3 p.m.

AMERICAN HOSPITAL ASSOCIATION

Results and Lessons from Large-Scale Improvement in Quality & Safety

Jonathan B. Perlin, MD, *HCA Holdings Inc*

Rishi Sikka, MD, *Advocate Health Care, Chicago*

Maulik Joshi, Dr.PH., *American Hospital Association*

Moderator: Richard J. Umbdenstock, FACHE, *President & CEO, American Hospital Association*

PHILIPPINE HOSPITAL ASSOCIATION

Philippine Hospitals: Scenarios in Pursuit of Universal Healthcare for All

Ruben Flores, MD, *President, Philippine Hospital Association*

Bu Castro, MD, *Director, Philippine Hospital Association*

Maria-Lourdes Otayza, MD, *Mariano Marcos Memorial Hospital and Medical Center*

Moderator: Jesus Jardin, MD, *Philippine Hospital Association*

IHF UNIVERSITY HOSPITALS SPECIAL INTEREST GROUP

University Hospitals and End-of-Life Care: Combining Humanity and Efficiency

Introduction: Irene Thompson, *President and CEO, UHC, Chicago*

Kathleen L. Vermoch, *Project Manager UHC, Chicago*,

Risto Miettunen, MD, PhD, *Kuopio University Hospital District, Finland*

Moderator: Barbara Anason, *Vice President, UHC, and UH-SIG Secretariat staff, Chicago*

UNIVERSITY HOSPITALS OF GENEVA (HUG)

Innovation: In Pursuit of Excellence in the Health Valley

Thomas Vogel, *Health Economist*

Karl Heinz Krause, *University of Geneva*

Claudine Mathieu-Thiébaud, *Director, External & International Affairs (HUG)*

Moderator: Karine Martinez, *External Affairs Deputy (HUG)*

FREE PAPER PRESENTATIONS

Healthcare Management: An HR Focus

- > Achieving Exceptional Outcomes through Excellence in Staffing: A Statewide Initiative to Leverage Best Evidence, **Joan Ellis Beglinger**, *MSN, RN, MBA, FACHE, FAAN* (USA)
- > Interprofessional Relationship of Medicine and Management is the Foundation of Success of Global Healthcare Systems, **Dr. Atefeh Samadi-niya, MD, DHA, PhD, CCRP** (Canada)
- > Participation of Professionals in the Strategic Day: A Case Study, **Laila Terradellas Antoñanzas** (Spain)
- > Inpatient Satisfaction Survey through QR-Coded Scanning by Smart Phones, **Tsair-wei Chien** (Taiwan)
- > The Retention Strategy for Nursing Cadre in Rashid Hospital, **Fatima Al Noman** (United Arab Emirates)

Tuesday, Oct. 6, 3:30 p.m.-5 p.m.

INTERNATIONAL FINANCE CORPORATION

Private Sector Innovation: Opportunities and Challenges

Tan See Leng, MD, *CEO, International Healthcare Holdings*

Jaime Cervantes, *CEO, Vitalmex*

Steven Tse, *Deputy Director, Asia Heart Hospital*

Victor Castillo, MD, *CEO, Fundación Cardiovascular de Colombia*

Moderator: Ioan P. Cleaton-Jones, MD, *Principal Health Specialist, International Finance Corporation*

LAGOS STATE HEALTH SERVICES COMMISSION

Millennium Development Goals and Health: Achievements and Challenges in Lagos State, Nigeria

Dr. Ahmid O. Balogun, *Lagos State Health Service Commission, Lagos, Nigeria*

Dr. D.O. Imosemi, *MD/CEO, Lagos Island Maternity Hospital, Lagos*

Dr. Olufemi Omololu, *Lagos Island Maternity Hospital, Lagos*

Moderator: Dr. Leke Pitan, *IHF Special Advisor for Africa*

AMERICAN COLLEGE OF HEALTHCARE EXECUTIVES

Healthcare Leadership & Opportunities: Perspectives From the Field

Cynthia A. Hahn, FACHE, CAE, *Senior Vice President, Member Services, ACHE*

Richard D. Cordova, FACHE, *President and CEO, Children's Hospital Los Angeles*,

Edward H. Lamb, FACHE, *Division President, Western Division, IASIS Healthcare*

Moderator: Deborah J. Bowen, FACHE, CAE, *President and CEO, ACHE*

COLOMBIAN ASSOCIATION OF HOSPITALS AND CLINICS (ACHC)

Developments and Innovations in the Quality of Care

Juan Carlos Giraldo Valencia, *Director General, ACHC*

Carlos Edgar Rodriguez Hernandez, *Director Acreditacion en Salud*

Andres Aguirre Martinez, *President, ACHC*

Moderator: Henry Mauricio Gallardo Lozano, *Director Hospital Universitario*

HONG KONG HOSPITAL AUTHORITY

Quality and Safety Management of Public Hospital Services in Hong Kong

Dr. Ian Cheung, *Chief Manager, Hospital Authority*

Dr. T.L Lee, *Chief Manager (Quality & Standards), Hospital Authority*

Fred Chan, *Senior Manager, Hospital Authority*

Moderator: Dr. C.C Lau, *Hospital Authority*

IHF SPECIAL SESSION

The Role of Rural/Local Hospitals in Providing Care in Remote Areas

Dominique Colas, *President, National Association of Local Hospitals (France)*

Scott A. Duke, *South Dakota Association of Healthcare Organizations (USA)*

Dr. Wang Jun Lee, *CEO & Chairman, Myongji Hospital (Korea)*

Moderator: Terence Carter, MD, *Director, Hospital Management & Planning, Department of Health*

FREE PAPER PRESENTATIONS

Patient and Community Focus

- > Enhancement of Quality of Informed Consent by System Change and Information Technology, **Dr. TANG Kam Shing** (Hong Kong)
- > Global Green and Healthy Hospitals Acting Together for Environmental Health, **Susan Wilburn** (Argentina)
- > Impact of Population Differences in the Area of Preventable Hospitalizations, **Jean Dowling Dols PhD, RN, NEA-BC, FACHE** (USA)
- > Public Hospital Transformation in a Resource Constrained Environment: A Case of Kenyatta National Hospital, Kenya, **Lilly Koros Tare** (Kenya)
- > The World's Best Stroke Service is in Helsinki, **Maaret Castren** (Finland)

Wednesday, Oct. 7, 10 a.m.–11:30 a.m.

HEALTHCARECAN AND ONTARIO HOSPITAL ASSOCIATION

Healthcare Leadership and Management Challenges: A Canadian Perspective

Ray Racette, *President and CEO, Canadian College of Health Leaders*

Dale Schierbeck, *Vice President, Learning and Development, HealthcareCAN*

Moderator: Bill Tholl, *President and CEO, HealthcareCAN*

FRENCH HOSPITAL FEDERATION & UNICANCER

French Hospitals: Strategies to Address Chronic Disease

Martine LaDoucette, *CEO, University Hospital Nîmes*

Patrice Viens, *General Manager, Paoli-Calmettes Cancer Institute*

Pascal Piedbois, *General Manager, Paul Strauss Cancer Center*

Vincent Meininger, *Assistance Publique Hôpitaux de Paris*

Dominique Somme, *University Hospital Rennes*

Moderator: Gerard Vincent, *CEO, French Hospital Federation*

PAN AMERICAN HEALTH ORGANIZATION

Ensuring Hospitals Remain Functional in Emergencies and Crisis

Dr. Felipe Cruz, *Chief, Special Projects, Mexican Social Security Institute*

Eng. Tony Gibbs, *Structural Engineer, Barbados*

Dr. Luis Fernando Correa, *Director, Ministry of Health, Colombia*

Moderator: Dr. Ciro Ugarte, *PAHO/WHO*

BRAZILIAN NATIONAL ASSOCIATION OF PRIVATE HOSPITALS

Healthcare Leadership in Brazilian Private Hospitals: How Are We Doing?

Fernando Torelly, *CEO, Hospital Moinhos de Vento (RS), Brazil*

Hildia Lima, *Quality Manager, Rede D'Or São Luiz*

Miguel Andoioglo, *Albert Einstein Jewish Hospital*

Moderator: Carlos Figueiredo, *CEO, ANAPH, Brazil*

UNIVERSITY HEALTHSYSTEM CONSORTIUM

Taking Better Care of Complex Patients: Findings from UHC's Frequently Admitted Patients Improvement Collaborative

Ed Fink, *Clinical Project Manager, UC Davis Medical Center*

Jennifer Houlihan, *Wake Forest Baptist Health*

Diane Nanno, *Upstate University Hospital*

Moderator: Danielle Carrier, *Project Manager, Quality Operations, UHC*

FREE PAPER PRESENTATIONS

Healthcare Management: Performance and Training

- > Developing Strategic Initiatives to Advance Global Healthcare Management Education, **Daniel J. West Jr., PhD, FACHE** (USA)
- > Improving Primary Care and Public Health Integration: Evaluation Using the Public Health Information Technology Maturity Index, **P. Kenyon Crowley, MBA, MS, CPHIMS** (USA)
- > Lessons in Leadership: How Clinicians Can Build Their Skills for Leadership and Management, **Ken Hekman, MBA, FACMPE** (USA)
- > Values-Based Leadership in a Healthcare Organization: Its Impact on Decision Making and Organizational Outcomes, **Premalatha Mony** (USA)

Wednesday, Oct. 7, 2:15 p.m.–3:45 p.m.

BELGIAN HOSPITAL ASSOCIATION

Ethical Challenges Facing Belgian Hospital Directors and Approaches to Healthcare Reform

Professor Guy Durant, *Former General Manager, University Hospital Saint-Luc*

Professor Marc Noppen, *CEO, University Hospital Brussels*

Francis de Drée, *General Manager, University Hospital Brugmann*

Jan Deleu, *General Manager, AZ Groeninge*

Moderator: Jan Beeckmans, *General Manager, University Hospital Brussels*

NORWEGIAN HOSPITAL AND HEALTH SERVICE ASSOCIATION

Norwegian Healthcare: Moving Towards a Bright and Innovative Future

Rolf Johannes Windspoll, *Norwegian Directorate of Health*

Tone Marie Nyboe Solheim, *The Norwegian Association of Local and Regional Authorities*

Kari Kvaerner, *Oslo University Hospital*

Moderator: Dr. Erik Normann, *CEO, Curato AS and IHF President Designate*

AUSTRALIAN HEALTHCARE AND HOSPITALS ASSOCIATION

Contemporary Leadership Issues for High- Performance, Universal-Coverage Health Systems

Dr. Deborah Cole, *Chief Executive, Dental Health Services, Victoria*

Bernie Harrison, *Peloton: Healthcare Improvement Consulting*

Sandy Thomson, *GovernancePlus*

Moderator: Prof. Gary Day, *Griffith University, Centre for Health Innovation*

JOINT COMMISSION INTERNATIONAL

Globalization and Healthcare: Travel, Talent and Trends

Andrew N. Garman, PsyD, MS, *Professor, Rush University*

Representatives of JCI accredited hospitals

Moderator: Paula Wilson, *President and CEO, Joint Commission International*

IHF SPECIAL SESSION

Hospitals and Big Data: Playing Field, Initiator or Stakeholder?

Dr. Shinya Matsuda, *University of Occupational and Environmental Health (Japan)*

Dr. Chakib Sari, *Montpellier Regional Cancer Institute (France)*

Dr. Raymond Gensinger, Jr, MD, CPHIMSS, FHISS, *Hospital Sisters Health System (USA)*

Moderator: Patrice Viens, *General Manager, Paoli-Calmettes Cancer Institute*

FREE PAPER PRESENTATIONS

Healthcare Delivery Challenges

- Advancing Health: A New Jersey Statewide Initiative Uses Gainsharing to Align Physicians and Hospitals to Lower Costs and Improve Quality, **Anthony C. Stanowski, DHA, FACHE** (USA)
- Care Delivery System: Population Health, **Margaret J. Holm, RN, PhD, FACHE** (USA)
- How Antimicrobial Stewardship Programs are Changing the Game Against Resistant Hospital Flora, **John Trowbridge** (USA)
- Sustainability Roadmap and Its Implications for the World, **Walt Vernon** (USA)
- The Future of Medical Tourism: Lessons Learned from Global Research– Linking Innovative Delivery to Best Practices in Meeting, **Michael A. Petrochuk, MHA, DBA, FACHE** (USA)

Wednesday, Oct. 7, 4:15 p.m.–5:45 p.m.

INTERNATIONAL FEDERATION OF COMMUNITY HEALTH CENTERS

Building a Solid Primary Care Continuum for the Health System

Bill Davidson, *centre Langs Community, Health, Wellness; CACHC*
Heidi Park Emerson, *health services researcher, Public Policy Division, NACHC*
Marc Bruijnzeels, *director Jan van Es Institute, Almere, The Netherlands*
Moderator: **Alison Verhoeven**, *Australian Healthcare and Hospitals Association*

HIMSS

Exploring the Value of Health Information Technology

Greg L Wolverton, *FHIMSS, Chief Information Officer, ARcare/KentuckyCare*
Vicent Moncho, *CIO, Marina Salud S.A.*
Thomas Martin, PhD, *Director, Health Information Systems, HIMSS*
Moderator: **Rod Piechowski**, *Senior Director, HIMSS*

GS1

Using Global Standards to Improve Patient Safety

Feargal McGroarty, *St. James Hospital, Ireland*
Dr. Heidi Wimmers, *Chief Pharmacist, Hospital Alemán de Buenos Aires, Argentina*
Dr. Jean-Michel Descoutures, *GIP Resah-IdF, France*
Moderator: **Siobhan O'Bara**, *Senior Vice President, Industry Engagement, GS1 US*

FREE PAPER PRESENTATIONS

Healthcare Delivery Innovations

- Development of Casemix Based Evaluation System in Japan, **Shinya Matsuda** (Japan)
- Job Stress and Burnout in Relation to Physical and Mental Health of Nurses in Southern Taiwan, **Yueh Li Yu** (Taiwan)
- Innovative Use of Available Technology to Contribute in Judicial Process as Witnesses—A Boon for Healthcare Professionals, **Prof. A.K. Gupta** (India)
- mHealth: Disrupting the Status Quo, Leveraging Lessons Learned, **David A. Collins, MHA, CPHQ, CPHIMS, FHIMSS** (USA)
- Indigenous Health Outpatient Department of University of Brasilia Hospital: Construction of Intercultural Health Practices in the Context of Brazil, **Maria Da Graça Hoefel** (Brazil)

Thursday, Oct. 8, 10:30–12 p.m.

UNIÓ CATALANA D'HOSPITALS

Promoting Innovation in Hospitals in a Public Healthcare System to Improve Healthcare Delivery, Quality and Efficiency

Lluís Blanch, *Corporació Sanitària Parc Taulí, Sabadell*
Laura Sampietro, *Hospital Clínic Barcelona*
Rosa Asbert, *Medical Manager, Mutua Terrassa, Terrassa*
Jorge Juan Fernandez, *Hospital Sant Joan de Déu, Barcelona*
Cristina García, *Parc Sanitari Sant Joan de Déu, Barcelona*
Moderator: **Anna Riera**, *Unió Catalana d'Hospitals, Barcelona*

TAIWAN HOSPITAL ASSOCIATION

Through the Innovative Technology Development to Provide a Holistic Patient-Centered Smart Solutions

Dr. Ming Chia Hsieh, *Changhua Christian Hospital*
Dr. Hsiu Chin Chen, *Director of Nursing, Chi Mei Medical Center*
Chaney Ho, *President, Advantech Co. Ltd*
Moderator: **Dr. Shou Jen Kuo**, *Vice President, Taiwan Hospital Association*

IHF HEALTHCARE EXECUTIVES SPECIAL INTEREST GROUP

Healthcare Leadership Competencies: A Global Perspective

Lucy Nugent, *Health Management Institute of Ireland*
Dr. Reynaldo Holder, *Pan American Health Organization (PAHO/WHO)*
Ray Racette, *MHA, CHE, Canadian College of Health Leaders*
Moderator: **Deborah J. Bowen, FACHE, CAE**, *President and CEO, ACHE*

PORTUGUESE ASSOCIATION FOR HOSPITAL DEVELOPMENT

Health Innovation: Future Challenges of Oncology Therapies

Ana Escoval, *President, Portuguese Association for Hospital Development*
João Martins, *Autoridade Nacional do Medicamento e Produtos de Saúde, I.P.*
Jorge Félix, *Director, Exigo, Portugal*
Moderator: **Carlos Pereira Alves, MD, PhD, PAHD**, *Portugal*

FREE PAPER PRESENTATIONS

Quality and Safety Advancement

- Building a Culture of Quality in Hospitals and Health Systems, **Muhanad Hirzallah, PhD** (USA)
 - Dubai Healthcare City: A Quality Success Story, **Dr. Ramadan Al Blooshi** (United Arab Emirates)
 - Maintenance of Medical Devices and Hospital's Quality Procedures in Developing Countries, **Dr. Mamadou SOW** (Senegal)
 - Pioneering Implementation of Simulation-Based Crew Resource Management Training in Hong Kong Public Hospitals, **Dr. TANG Kam Shing** (Hong Kong)
 - Reduction of Blood Transfusions and Hospital Expenses through a Lean Six Sigma-Based Process Improvement, **Dr. Charles Callahan** (USA)
-

FREE PAPER PRESENTATIONS

Improving Access and Effectiveness of Care

- Community-Based Plan of Care: A Healthcare System's Strategy to Decrease Acute Care Readmissions and Overall Cost of Care, **Paula J. Thompson, RN, MS** (USA)
- Expansion of Health Insurance Coverage in Korea and Issues to be Resolved, **Sang-keun Park** (Republic of Korea)
- Ghana: An Innovative Network Model, **Jim Slack** (USA)
- The Lighthouse Hospital Project: Improving the Patient Journey for Aboriginal and Torres Strait Islander Peoples with Acute Coronary Syndromes, **Carrie Sutherland** (Australia)
- Tons of Hope: The Philippines, a Case Study, **Walt Vernon** (USA)

Disruptive trends in Health Information Systems



ERIC DE ROODENBEKE
CHIEF EXECUTIVE OFFICER
INTERNATIONAL HOSPITAL FEDERATION



ALEXANDER S PREKER
CHAIR, EXTERNAL ADVISORY BOARD,
INTERNATIONAL HOSPITAL FEDERATION

Entrepreneurial activity and investment in health technology is at an all-time high. It is seen as the potential “game changer” in solving some of the age-old problems in quality, efficiency and more equitable access to care for the population that for decades has bedeviled the delivery of modern health care in most countries.

The recently introduced Affordable Care Act (ACA) in the USA, was a watershed in U.S. public health policy. Through a series of extensions of, and revisions to, the multiple laws that together comprise the federal legal framework for the U.S. health-care system, the Act establishes aims to achieve near-universal guarantee of access to affordable health insurance coverage, from birth through retirement. Although this may seem as catching up with the norm already established in OECD countries, most middle- and low-income countries are still trying to reach this illusive dream.

Implementation of many of the complex reforms that are included under Affordable Health Care Act, like those in most other countries, relies on new and innovative solutions in the collection, management and use of data. This component of universal health coverage is often underestimated while transaction costs may put at stake very large amount of resources. For the insurers whether public or private reducing transaction cost of payment to providers is by far more complex than revenue collection. For service providers getting paid by multiple insurers is often far more challenging than providing healthcare, and it can be very costly. Recent studies from Commonwealth fund has identified that up to 25% of expenses in US hospitals are administrative costs. (<http://www.commonwealthfund.org/publications/in-the-literature/2014/sep/hospital-administrative-costs>)

The Healthcare Information and Management Systems Society (HIMSS) is the largest global, not-for-profit organization focused on improving health care through better data management and information technology.

Since 2007, the HIMSS Venture+ Forum has been the best marketplace and showcase in the world for the new innovative ideas in health information and management systems. “HIMSS recognizes the important role startup and early stage companies have in advancing the connected health ecosystem”, said H. Stephen Lieber, President

& CEO, HIMSS. According to Venture + Forum founder Howard Burde: “The focus on emerging health IT businesses includes developing access to capital, customers, strategic partners and entrepreneurial education”.

The Mobile Venture Fair which is part of their mHealth Summit, specializes in showcasing what is new in the rapidly expanding mobile environment. And the National Health Innovation Summit, also hosted every year by the HIMSS, brings together healthcare organization executives, innovation officers, government and policy leaders, payers, consultants and other healthcare leaders, to explore demonstrated, real-world innovations that improve healthcare quality while lowering costs.

Not surprisingly, most of those that work in the hospitals sector – from clinical staff to mid-level managers to senior C-Level Executives – are watching closely what is happening in the health information technology space.

Many of the articles featured in this issue of the World Hospitals and Health Services (WHHS) Journal were written by companies that competed at the HIMSS15 Venture+ Forum during the HIMSS annual conference this year. It is important for healthcare decision makers to have an early understanding of these new technologies that may be very disruptive in regard to current organization of healthcare providers. As the change management process is known to be slow in healthcare organizations, it is only by being ahead of the wave that adoption of technology will be timely.

We invite you to continue exploring new and innovative technology solutions to the challenges you face in your own work during the upcoming 39th World Hospital Congress (WHC) of the International Hospital Federation (IHF) in Chicago, Oct 6-8, 2015 and the related Chicago 2015 Health Venture Fair side-event on Oct 8, 2015 which we have organized at the time of this year’s congress. For more details on this year’s Congress please see the congress program at <http://WorldHospitalCongress.org> and <http://Chicago2015.HealthVentureFair.com>.

We thank the American Hospital Association (AHA) and the American College of Health Care Executives for hosting the 39th Congress in the USA this year. This will be another opportunity to touch upon the importance of technology shaping up the future of healthcare.

HIMSS Venture+ Forum and HX360 Provide Industry View of Health Technology Innovation, Startup and Investment Activity; Advancing the New Model of Care



HOWARD A. BURDE
FOUNDER OF HIMSS/HIT
VENTURE+ FORUM AND PRINCIPAL AT HOWARD
BURDE HEALTH
LAW, LLC, USA



RICHARD SCARFO
VICE PRESIDENT, PERSONAL CONNECTED
HEALTH ALLIANCE AND DIRECTOR,
MHEALTH SUMMIT, USA

SUMMARY: Presented by HIMSS, the Venture+ Forum program and pitch competition provides a 360-degree view on health technology investing and today's top innovative companies. It features exciting 3-minute pitch presentations from emerging and growth-stage companies, investor panels and a networking reception. Recent Venture+ Forum winners include TowerView Health, Prima-Temp, ActualMeds and M3 Clinician.

As an industry catalyst for health IT innovation and business-building resource for growing companies and emerging technology solutions, HIMSS has co-developed with AVIA, a new initiative that addresses how emerging technologies, health system business model changes and investment will transform the delivery of care. HX360 engages senior healthcare leaders, innovation teams, investors and entrepreneurs around the vision of transforming healthcare delivery by leveraging technology, process and structure.

Entrepreneurial activity and investment in health technology is at an all-time high. As an industry champion of health IT innovation for better health engagement and outcomes, HIMSS has long been a leading catalyst and business-building resource for growing companies and emerging technology solutions.

Since 2007, the HIMSS Venture+ Forum has provided a platform for new products and companies in the healthcare IT space. "HIMSS recognizes the important role startup and early stage companies have in advancing the connected health ecosystem. To support their efforts, we have created an important forum for entrepreneurs, startups, the investment community and

other key parties, to inspire innovation, fuel collaboration and reinvent health as only entrepreneurs can," said H. Stephen Lieber, CAE, President & CEO, HIMSS. "From cutting-edge presentations and interactive exhibits to industry competitions and special events, HIMSS has designed several opportunities for entrepreneurs to deliver the knowledge, tools and contacts for startup success."

Many of the companies featured in this issue of the journal competed at the HIMSS15 Venture+ Forum that took place at HIMSS annual conference on April 12, 2015, McCormick Place, Chicago. The HIMSS15 Venture+ Forum program provided a 360-degree view

on health tech investing and showcased today's top innovative companies.

Again this year, HIMSS will also be hosting the Venture+ Forum at the HIMSS Connected Health Conference, as part of the pre-conference activities, on Sunday, November 8, 2015, at the Gaylord Resort and Convention Center in the Washington, DC area. This year's program will provide a clear and expansive view of the current environment for investment, financing and partnership in light of the rapid pace of change in healthcare. The Venture+ Forum also features a pitch competition that will showcase presentations from today's leading-edge health tech companies.

The focus on emerging health IT businesses includes developing access to capital, customers, strategic partners and entrepreneurial education, according to Venture + Forum founder Howard Burde. Indeed, many Venture + Forum companies use the HIMSS program platform to develop further opportunities to reach potential investor, collaborator and user audiences. The Venture+ Forum allows conference attendees to experience a high-impact exchange of predictions, insights, information, debate and advice that will drive decision-making and fuel new partnerships for healthcare delivery transformation. The Venture+ Forum's signature pitch competition features up to 20 nominated startups—selected according to standards for demonstrated impact or quantifiable results—in rapid-fire, three-minute pitch-style presentations. Finalists will advance to compete at the Venture+ Forum finals taking place at the mHealth Summit, part of the HIMSS Connected Health Conference, on November 10.

[HX360 Program Focuses on Innovation in Care Delivery](#)

Hospital associations, healthcare organizations and providers have more opportunities than ever to capitalize on advances in health technology, following a record year of investments and strong innovation. In addition, leading healthcare systems are recognizing the strategic importance of high-functioning innovation capability. Executive health leadership, emerging and growth-stage company founders and key industry stakeholders will have the opportunity to explore *Advancing the New Model of Care* at the second annual HX360 event taking place at the HIMSS16 Annual Conference and Exhibition, February 29-March 4 in Las Vegas.

HX360, co-developed by HIMSS and AVIA, is a new initiative that addresses how emerging technologies, health system business model changes and investment will transform the delivery of care.

HX360 engages senior healthcare leaders, innovation teams, investors and entrepreneurs around the vision of transforming healthcare delivery by leveraging

technology, process and structure. HX360 seeks to help resolve care delivery challenges by: (1) sharing successful examples of change and workflow management, both inside and outside of healthcare; (2) highlighting technologies that can facilitate this change through thought leadership; and (3) provide a forum for next-generation technologies to be funded for success.

BIOGRAPHIES

Howard Burde is a nationally recognized health lawyer, who provides general counsel and health law advice to health care providers and payers, health information technology organizations and health care businesses. Howard served in the Governor's Office in Pennsylvania under Governors Ridge and Schweiker as the Deputy General Counsel responsible for all health and human services law and policy. Prior to that appointment he was Chief Counsel of the Pennsylvania Department of Health. Howard Burde is a prolific author of four books on health law topics¹, the most recent of which was translated and published in Japanese and Korean, and including the premier books on Pennsylvania Health Law and Utilization Management Law. Howard has been named to Best Lawyers in America, and a Pennsylvania Super Lawyer, both on an annual basis. Howard is a Board Member of the Center for Autism, the Pennsylvania Academy of Ballet and the Lower Merion Soccer Club.

Richard Scarfo joined HIMSS in 2012 to manage the events portfolio of the Media division and serves as Director of the mHealth Summit – an event he created in 2008. Currently, Scarfo serves as the Vice President of the Personal Connected Health Alliance, a collaborative effort of Continua, mHealth Summit and HIMSS. In this role, he develops strategic direction for mobile and personal health activities globally and continues to manage and build the mHealth Summit, with activities on four continents all connected to the host event in the United States which is now the largest mobile health event in the world. Rich brings 25 years of experience from his previous roles at CEA's Consumer Electronics Show, the Electronic Entertainment Expo (E3) and the Foundation for the National Institutes of Health.

¹ [The Health Laws of Pennsylvania](#), PBI, 2000; [The Utilization Management Guide, Third Edition](#), with Reiter, URAC, 2005; [Establishing a RHIO, with Theilist and Jones](#), HIMSS, 2007; [Personal Health Records, with Miller and Yasnoff](#), HIMSS, 2009

Facilitating Virtual Health Management Using Medical Device Integration



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ABSTRACT: Data from connected medical devices (CMDs) provides an objective and rich source of information to augment patient care management and clinical decision making. A principal reason is measurements of patient properties made through bedside CMDs are not typically subject to errors associated with misinterpretation, incorrect recording, and incorrect time stamping. Furthermore, data from CMDs can be collected regularly, ensuring a dense and robust data record on a given patient. The ability to remotely manage and monitor patients is greatly facilitated by access to data, as measurements represent an objective source of information that facilitate clinical decision making.

In my recent book, *Connected Medical Devices: Integrating Patient Care Data in Healthcare Systems*, I discuss the topic of medical device integration (MDI) in relation to implementing CMDs in healthcare settings as a guide to assist hospitals in this undertaking. The following discussion about MDI are the opening paragraphs from this text, followed by a discussion of MDI architectures.

MEDICAL DEVICE DATA INTEGRATION

Integrating medical device data (MDD) into health information technology (health IT) systems was at one time an esoteric need, of primary interest only to those conducting research in the healthcare environment. Over the course of the past decade, and in part due to the focus on patient safety and Meaningful Use (MU) guidelines, Medical Device Interoperability/Integration (MDI) has become a significant part of mainstream health IT system deployment and a key requirement:

“The 2012 U.S. Medical Device Integration (MDI) Study, involving insight from >300 hospitals and vendors, indicates that >54% of U.S. hospitals plan to purchase new Medical Device Integration (MDI) solutions and 40% cite quality improvement as the primary investment driver.”ⁱⁱ

Furthermore, studiesⁱⁱⁱ have estimated that:

“Each Connected Medical Device (CMD) saves from 4 to 36 minutes of nursing time and prevents up to 24 data errors daily. CMDs can save over 100 hours of nursing time per day in a typical hospital...”

The time required to manually collect and chart data derived from medical devices is not insignificant, with the passage of minutes per measurement not uncommon in the enterprise high-acuity settings of critical care, anesthesia, and other areas—areas in which regular charting of findings derived from medical devices is required per the plan of care and practice of medicine.^{iv} Hence, the value of connecting medical devices to the IT infrastructure is being recognized institutionally.

My recent book on connected medical devices (CMD) was intended to be a practical treatment of the process of implementing an MDI solution within a healthcare enterprise. In the context discussed here, MDI refers to the communication of data from connected medical devices to end-point recipients such as electronic health record systems (EHRs), data warehouses, standalone clinical information systems (CISs) and related health IT systems. The most general term for each health IT system will be used throughout this text.

The interoperability of medical devices refers to the ability of these devices to interact with one another to achieve some clinical purpose or use case. The Association for the Advancement of Medical Instrumentation (AAMI) offers the following definition of interoperability in the context of medical devices:^v

“...[the] ability of medical devices, clinical systems, or their components to communicate in order to safely fulfill an intended purpose.”

In the context presented here, the terms interoperability and integration will be used synonymously. The integration of connected medical device data will refer, for the purpose of this text, to the extraction, translation, conditioning and communication of medical device data for use within a health IT system.

While creation and implementation of software and hardware to achieve MDI is an essential element, this text is not focused on the writing of software—such as medical device drivers, which enable the communication of medical device data through their proprietary language mechanisms. Creation of medical device

drivers is outside the scope of this text. One source that provides some detail (including software) as examples of such has been developed by the author and is included as a reference.^{vi}

While the usual purpose of MDI is to communicate discrete data from medical devices normally employed as part of the workflow at the point of care (POC) to the health IT system, this use is not the only one, or not even the most interesting use of data from medical devices at the POC. MDI helps to remove the manual and error-prone aspects of the recording MDD: introduction of error due to misinterpretation, errors due to transcription, and errors due to associating information from one patient with that of another. So, from the patient safety perspective, MDI aids in ensuring that data are collected regularly and more accurately on any given patient and that they are communicated reliably to the end-point health IT system. Hence, the availability of rich and timely data derived from medical devices helps to improve the knowledge of patient state, thereby facilitating better clinical decision making.

This statement seems to be logical. But what evidence exists to sustain the assertion that MDI benefits patient care?

The Medical Device Interoperability Coordinating Council (MDICC) and the Westhealth™ Institute published an assessment in March 2013 (“The Value of Medical Device Interoperability”) in which they asserted that the intrinsic value in MDI can liberate \$30B+ in annual healthcare savings, principally drawn from improvements in patient safety.^{vii}

In addition, a recent InformationWeek Healthcare article asserted:^{viii}

“...44% of the nearly 300 responding hospitals said they had purchased an MDI application in recent years. The majority of those purchases were made in 2011 and 2012.”

Furthermore,

“...the adoption of MDI solutions [is expected] to continue to accelerate over the next two years as more than half of U.S. hospitals plan to purchase new MDI solutions.”^{ix}

The value of MDI has received more publicity and a higher profile in recent years. In 2012, the U.S. Food and Drug Administration (FDA) and AAMI convened a joint summit focused on seeking industry input as part of a “multidisciplinary ‘learning event’” aimed at identifying and prioritizing issues in MDI.^x

One of the key questions asked was “why interoperability? Why now?”

“The advancement and availability of new technologies, coupled with a growing number of serious public health concerns and adverse patient events in which interoperability issues have been [at] root cause... Many events, publications, and conversations have focused on the information side of what technology can do. Little attention to date has been focused on the device side of that connectivity, especially as it relates to patient safety.”^{xi}

Other uses for data derived through MDI are

related to clinical decision making:

“[d]ata need to support clinical decision-making, patient safety, and patient care:

- Rich, timely data for patient care management;
- Temporally and semantically synchronized data to ensure accuracy in patient management; and
- Secure, ubiquitous access to ensure availability to data for patient care management.”^{xii}

Distilling the key reasons to the following, MDI supports very pragmatic and real needs to improve patient care and patient safety, including

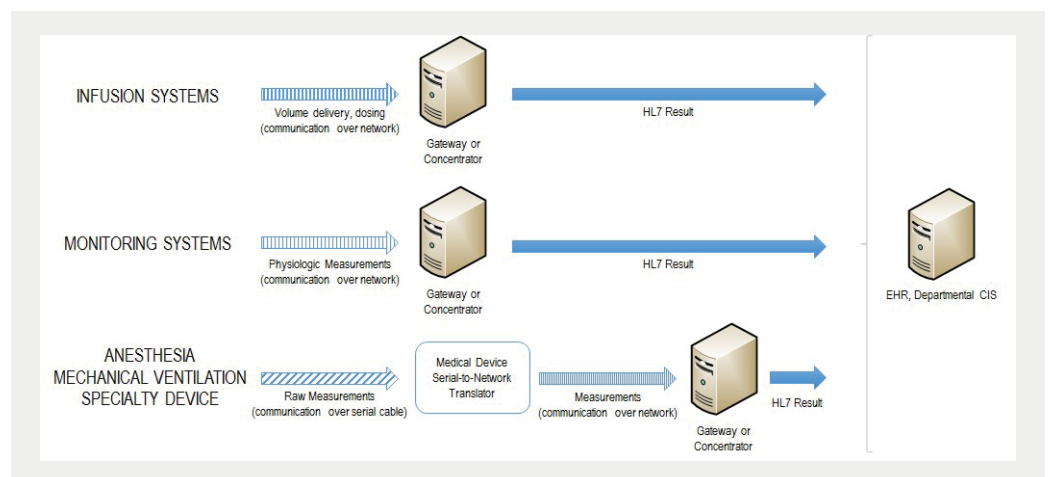
- reducing clinical documentation transcription errors
- improving data accuracy and density within the clinical records
- ensuring the complete capture of patient care data

Those individuals tasked with implementing MDI within the hospital inpatient setting may have not been previously exposed to the process, technologies or implementation details and, so, are looking at ways to “bootstrap” the process or, at least for a starting or jumping off point for the process. The objective in the pages that follow is to provide constructive guidance toward this end.

MDI ARCHITECTURE

Data collection from multiple CMDs can be accomplished over enterprise networks, from point-of-care medical devices, either through direct communication or through translation from serial ports at the point of data collection. The figure below depicts in greatly simplified form the data communication pathways from 3 different classes of medical devices that are frequently used in the hospital environment: infusion systems (i.e., pumps), monitoring systems, and specialty medical devices (e.g.: mechanical ventilators, anesthesia machines, bypass machines, intra-aortic balloon pump, etc.). Many medical devices that can communicate on networks do so through either a manufacturer-supplied or third party conduit, or Gateway. This Gateway serves to aggregate data from the individual medical devices (in this case, physiologic monitors or infusion pumps) and present their data in a consistent format (e.g.: Health Level Seven, HL7, observations) which can then be consumed by electronic health record systems (EHRs) and clinical information systems (CISs).

In the case of certain types of specialty medical devices,



including mechanical ventilators, many anesthesia machines, and other devices, their data are presently only accessible via serial port data communication. Before these data can be consumed by EHRs it is necessary to translate these data into a format that can be communicated over an enterprise network. Frequently this is accomplished using Medical Device Translators that sit at the point of data collection and communicate with the point-of-care medical devices using the proprietary formats and communication protocols mandated by these medical devices. It should be pointed out that there currently exists no standard for this proprietary medical device communication: most medical device manufacturers that do not support basic HL7 from the device itself employ their own unique medical device data communication format.

Communication of the HL7 Result normally takes place over the hospital enterprise network. As this is a protected network, and as the HL7 Result may contain patient-identifying information, security of this communication is extremely important. Furthermore, the rate of data transfer can vary depending on the information needs of the specific hospital departments. For instance, data communication requirements in the operating room are at a frequency of one set of measurements per minute or faster. Data collection requirements in the intensive care unit (ICU) are less frequent; perhaps one set of measurements from a medical device every few minutes. In general hospital wards, data collection frequencies much less; perhaps one set of measurements every several hours. In ambulatory or home health environments, data collection may be once or twice a day. The great variability is driven by the care and data collection needs of care providers and the acuity of patients.

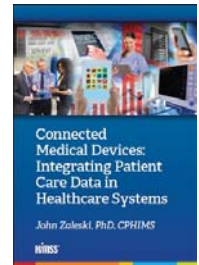
Since the data are communicated over the enterprise network, they are available to authorized recipients of such data, usually in the form of EHR charting systems. These charting systems can be accessed from anywhere within the network, or anywhere from which the end user is authorized to access.

SUMMARY

Data from CMDs provide for an objective source of information with which to facilitate overall patient care management and clinical decision making. Because data from CMDs can be automated, it is relatively free from subjective or interpretive error and can be transmitted over secure enterprise networks to support remote viewing, clinical charting, and analysis. In the future, as growing recognition for the value of CMDs evolves, manufacturers will be further motivated to provide more ubiquitous access to their data to support more clinical use cases, including those medical device in use within the hospital as well as those in use for chronic disease management in the home.

BIOGRAPHY

John Zaleski, PhD, CPHIMS, brings more than 25 years of experience in researching and ushering to market devices and products to improve healthcare. He received his PhD from the University of Pennsylvania, with a dissertation that describes a novel approach for modeling and prediction of post-operative respiratory behavior in post-surgical cardiac patients. Dr. Zaleski has a particular expertise in designing, developing, and implementing clinical and non-clinical point-of-care applications for hospital enterprises. Dr. Zaleski is the named inventor or co-inventor on 7 issued patents related to medical device interoperability. He is the author of numerous peer-reviewed articles on clinical use of medical device data, information technology and medical devices and wrote two seminal books on integrating medical device data into electronic health records and the use of medical device data for clinical decision making. His latest book, *Connected Medical Devices: Integrating Patient Care Data in Healthcare Systems*, was published this past April and was the #1 selling new book at HIMSS 2015.



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Hospitals will send an integrated nurse home with each discharge



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ABSTRACT: Hospitals must adapt to the rapidly changing environment of risk by changing the health behavior of their population. There is only one way to do this efficiently and at scale; send a nurse home with every patient at the time of discharge. That nurse can ensure adherence to medication and slowly, over time, transform personal behavior to evidence based levels... basically taking their medication as prescribed, changing eating habits, increasing exercise, getting people to throw away their cigarettes, teaching them how to cope, improving their sleep and reducing their stress. But, this approach will require a nurse to basically “live” with the patient for prolonged periods of time, as bad health behaviors are quick to start but slow to change or end. The rapid developments in artificial intelligence and natural language understanding paired with cloud based computing and integrated with a variety of data sources has led to a new marketplace comprised of cognitive technologies that can emulate even the most creative, knowledgeable and effective nurse. Termed the Virtual Health Assistant, your patients can literally talk to these agents using normal conversational language. The possibility to send a nurse home with each patient to maintain adherence and prevent readmissions has arrived. The technology is available. Who will step forward to reap the rewards first?

For a moment, just a moment, lets suspend reality. Think about a time in the future where you are not constrained by resources and your organization has incentives to keep people well. You are dealing with a 66 year-old Medicare patient, Paul, about to be discharged after his first heart attack and resultant mild congestive heart failure. Paul also had a “touch of sugar” and is a typical retired worker from a blue-collar job. Paul has accumulated a lot of bad habits over his lifetime and you are now responsible, at least financially, for his health.

Your responsibility is to prevent Paul from having further admissions, especially a “readmission” and also prevent Paul from deteriorating further. You have a long-term risk-based-contract to do this.

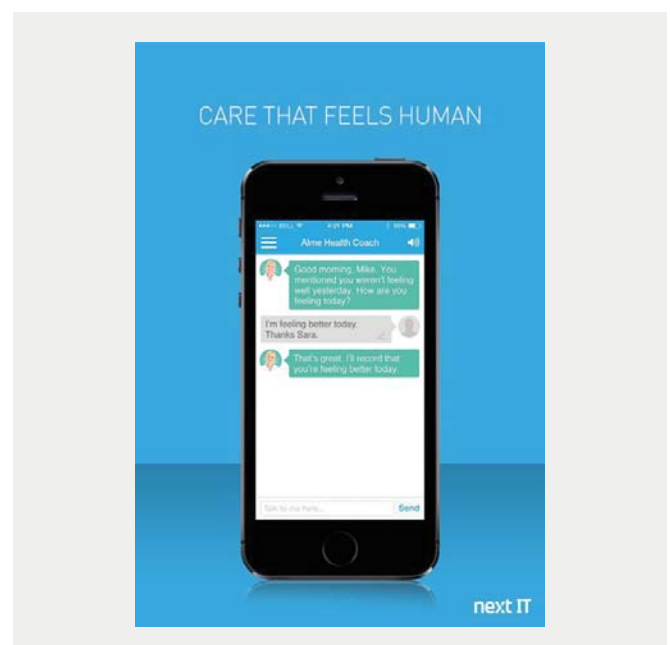
You decide to assign Janice, a truly exceptional nurse, to go home with Paul to stay with him and his wife... to teach him about the nuances of his new medication, the pathophysiology of a heart attack, how important it is to change his lifestyle including a complete do-over on his diet and exercise... to help with a 35 lb weight loss and smoking cessation...how to choose proper food... the list goes on and on. You tell Paul that Janice can stay as long as it takes.

Janice has access to numerous hospital and health plan data bases; the EHR, the PBM drug data, lab, claim systems, virtually any data source... even down to the wearables and glucometer data. Furthermore, Janice is trained to use Motivational Interviewing along with the most widely used health behavior models such as Prochaska’s Readiness to Change, the Health Belief and

Social Cognitive theories as well as numerous others.

Janice will track medication to ensure each drug is taken as prescribed. When Paul does not follow all of the evidence based medical care just prescribed (and it is inevitable), Janice will gain Paul’s trust in order to determine the barriers to following the treatment plan and try to overcome them.

Janice has at her fingertips a whole library of facts about diabetes, heart disease, and nutrition. In fact,



Janice can answer over 10,000 questions and never tires of hearing the same questions every day as she slowly... very slowly... over weeks and months cares for Paul.

Janice knows that behavior change does not occur quickly. She knows that Paul has feelings of ambivalence and resistance. Janice is also acutely aware that Paul is also concerned about how his new medication will affect his life... and his ability to do what he has done in the past.

Now stop dreaming because Janice is now a real possibility; at least a “virtual Janice” in the form of a Virtual Health Assistant (VHA). The creation of Janice is the result of rapid advancements in smartphone adoption, the ability to understand natural language and advanced artificial intelligence.

The use of a virtual health assistant is inevitable given the unprecedented number of mergers or announced mergers such as Aetna-Humana, Anthem- Cigna, United Health Care-Catamaran as well as the almost innumerable mergers occurring in the hospital industry. All of this activity is further indication of the move from volume to value... and every institution is seeking new ways to treat large populations... on a budget; a movement termed “healthcare to health”.

But how do hospitals and the newly forming integrated systems move from health care to health? They must focus on behavioral change.

Behavior is at the foundation of the tsunami approaching our shores; diabetes, cardiovascular disease. Both of these share the same causality: behaviors involving lifestyle and lack of adherence to evidence based medicine.

Diabetes and Heart Disease as a Case Study for a Virtual Health Assistant

The CDC predicts that one in three Americans will develop diabetes by 2050. And diabetes is part of a spectrum of diseases that includes cardiovascular disease. These are the people who will fill your hospitals in the future... and you will be at risk for their costs and therefore their overall health.

We have watched this tsunami approaching for nearly a half-century, and nothing we have done up until this point has changed its course. Think that through. All of the “things” you are doing right now were most likely being taught as a strategy 4 decades ago and were being done in practices around the country. The intensity of activity may have increased but the actual interventions are basic to human health; proper nutrition, weight control and exercise.

Psychologists have been studying how to change people’s behavior for over a century, and literally thousands of studies have defined over 80 theories and models. Each of these has been proven to result in behavior change in academic studies. But, according to a recently published Cochrane Database Systematic Review: Interventions for Enhancing Medication Adherence, the fix is not one

size fits all. “Current methods of improving medication adherence for chronic health problems are mostly complex and not very effective,” the review, authored by Niewalaat, et al., states. “The full benefits of treatment cannot be realized.”

Another key review, funded by the AHRQ and published in the Annals of Internal Medicine in 2012, Interventions to Improve Adherence to Self-administered Medications in Chronic Disease in the United States, Meera Viswanathan, PhD, et al., found 4,124 citations in published searchable medical literature concerning improving adherence. In this review, Dr. Viswanathan concluded that “reduced out-of-pocket expenses, case management, and *patient education with behavioral support all improved medication adherence,*” but went on to state, “evidence is limited on whether these approaches are broadly applicable or affect long-term medication adherence and health outcomes.”

The basic approach to most behavioral change and adherence efforts is to use face-to-face meetings or a telephonic based disease management (nurse advice lines) as well as a myriad of educational resources. But these techniques are very resource-intensive. Simply put, the behavior-health theories and models work in small, very costly settings, but, when applied to the real world, they demonstrate issues with scalability, cost, and complexity.

Having watched the almost unimaginable rise in the incidence and prevalence of diabetes and pre-diabetes, paired with the associated dramatic increase in obesity, how can anyone conclude that a program using nurses, doctors and other hospital workers to change behavior will work? It has not worked over the past 40 years and doing the same will not work in the future...it’s time to deploy technology, but what technology?

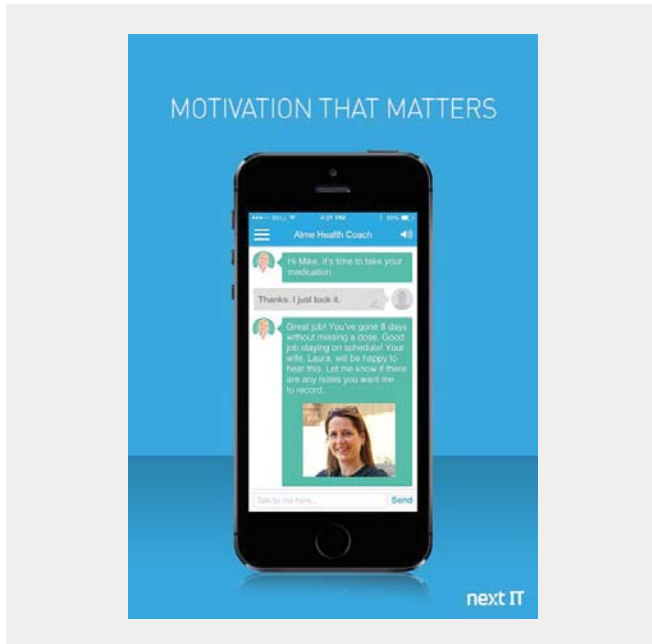
Current Types of Technology for Adherence

Numerous technologies have been developed to improve adherence and behavior change and ultimately outcome.

They can be broadly classified as:

- EHR and electronic prescribing
- Telemedicine and telemonitoring
- Predictive modeling & adherence risk scoring
- IT platform (e.g., health plan or retail pharmacy reminders via IVR or text)
- Cloud-based medication support
- Digital or mobile apps, including games
- Web-based programmed learning
- Packaging (smart pills, blister packs, smart caps, bottles, boxes, pill dispensers)

The top four — EHR, electronic prescribing, telemedicine and telemonitoring — are, for the most part, physician-focused attempts to contribute to adherence and improve outcome. The EHR can be set up to produce



reports on patients who need to be seen for a specific disease or condition. Electronic prescribing loops in the retail pharmacist, who can then tie-in the retail pharmacy systems and processes to remind people to pick up their prescriptions. Although there is some evidence that these processes work, they lack the ability to fully engage a patient on more than just the medication component of treating chronic disease. And the frequency of that engagement is every 30 or 90 days.

A number of software vendors offer predictive modeling and adherence-risk scoring. These are ways to assist health systems, large retail chains and managed-care insurers in predicting who might be less likely to adhere to medication. But a human intervention is still needed in order to interact with the patient – a very resource-intensive process.

Many medical institutions now offer IVR or text-based reminder services. They remind people about an upcoming appointment, to take a daily med and order a refill. In general, these are one-way “push” messages. There are also two-way systems that rely on word-recognition technology to attempt to understand any return message. Because of the limitations of these technologies, the ability of a system to actually understand any return text is limited. Most of these systems can only understand simple yes and no messages. For instance, if the text asked, “Did you take your medication?” and you responded, “Yes, and I think I am having a heart attack,” the system would understand the “Yes” only. The rest requires a human review sometime in the future, hopefully sooner rather than later.

Cloud-based websites rely on providing a body of knowledge to answer questions using a FAQ format. Hospitals commonly have websites with a plethora of data, but it is up to the user to sift through massive amounts of information to find their answer. Most people

give up before finding the answer they were seeking and either give up or call the call center, adding further burden to an already burdened system.

There are literally hundreds of apps available for smartphones that are focused on adherence improvement. But, apps are limited in their ability to analyze complex behaviors and responses. Most only offer a handful of functions and most are actually offered by pharmaceutical companies to support their brands. To date, they are little more than text-based reminders combined with a personal diary to record whether the medication was either taken or not taken and in some cases can tell their pharmacy that a refill is needed... hardly a game changing technology. These apps tend to be abandoned within 30-45 days after downloading because of the lack of interaction between the user and the support. They lack a soul.

Structured learning modules also are available, but most require a dedicated amount of time in front of a computer terminal, access, basic knowledge to start and most are... well... boring.

Numerous “adherence” approaches are being used that can be generally described as packaging. The old-fashioned blister packs marked with the days of the week such as a Medrol Dose Pack have long been used. Pill boxes, first made of plastic, now connect electronically to smartphones and provide a more high-tech approach to this simple reminder process. The smart pill has a radio-frequency identification (RFID) chip that transmits the date and time of ingestion of a medication. Large “Frisbee” size dispensers can be used to dispense multiple times per day and some can even alert a call center or caregiver to intervene if need be.

The aforementioned technologies have significant limitations. They either rely on humans or if automated, most are one-way communication avenues. They do not enter into a conversation and have a limited ability to actually inquire about why a person is not following instructions. Additionally, these systems are not able to actually solve a problem, allowing non-adherence to continue. Today’s systems do not integrate with other adherence systems – i.e. exercise apps – and are typically not able to deal with lifestyle issues. Since no disease is made better by inactivity and a poor diet, a more comprehensive approach is needed that can deal not only with forgotten meds, but also root causes of non-adherence to diet, exercise and medication.

Adherence is Very Complex

Engagement and adherence are complex behaviors. Only a small portion of non-adherence is due to forgetfulness. There are literally thousands of reasons that people do not remain adherent to their total treatment regimen. They include:

- Quality of patient-provider relationship
- Reimbursement/cost
- Disease management support

- Competing priorities
- Socioeconomic status
- Social support
- Symptom severity
- Condition-related disability
- Rate of progression
- Comorbidities (depression, substance abuse)
- Complexity of regimen
- Restrictions on diet, meals, etc.
- Immediacy of beneficial effects
- Side effects/adverse events
- Ability to follow instructions
- Knowledge and skills (e.g., injection or inhaler technique)
- Degree of family dysfunction
- Education and literacy
- Personal beliefs
- Motivation
- Confidence (self-efficacy)
- Acceptance of disease
- Understanding of disease
- Ability to engage in illness-management behavior
- Perceptions, attitudes, expectations
- Neurocognitive function
- Psychological status

Is it any wonder that a single program, simple app, text reminder or device does not work?

The Solution is Automated Intelligent Engagement

Behavioral models work because they are based on patients interacting with a health-care professional to obtain knowledge, improve motivation, provide the proper recognition and treatment of adverse events, deal with financial hardship, improve attitude, etc. They also work because a skilled therapist breaks down the changes into bite-sized pieces. In fact, B.J. Fogg, a Stanford psychologist specializing in behavior change states that for a behavior to change, you must first have a motivated person, the change must be small... meaning the patient needs to be actually “able” to make the change and the desired behavior needs to be triggered... repetitively.

Changing behavior is very time consuming and requires a myriad of interactions – something beyond the reach of all of the technologies above. Unless, of course, you couple them with access to a 24 hour/day nurse.

The VHA can provide that “human”-to-human level of involvement at a fraction of the cost to the healthcare delivery system and the patient.

Dr. Timothy Bickmore, a professor at the College of Computer and Information Science at Northeastern University in Boston, is perhaps the most published expert

in the field of virtual health assistants. He studied his form of a “Janice”. Resoundingly, 78% of users preferred the VHA over a live nurse or physician. Furthermore, his “Janice” reduced hospital readmissions by 30%.

A VHA can understand normal, everyday language and respond in a conversational manner. With the ability to converse, the VHA can provide not only scripted education but also answers to complex questions. In fact, a typical VHA will be capable of understanding and answering variations of 10,000 specific questions. And, a VHA can integrate with all of the other technologies listed above and then some.

The use of technology to improve health is ever-present. But the use of intelligent engagement is just starting. Think about the revolutionary ways your organization can utilize this technology. Instead of just reminding people to take their medication or refill their prescription, what if you could actually help them with these actions as well as help them modify their diet and exercise? What if you could motivate them with contests, and games? What if you could gain intimate insight into their daily lives? Most importantly, what if you could delay or eliminate the consequences of progressive diseases by helping people stay at goal?

The problems are immense, and the solution is not throwing more people at your patients. The solution is a virtual health assistant available to each and every one of your patients. The technology is ready, are you?

BIOGRAPHY

Thomas Morrow, Dr. Morrow brings to Next IT over 30 years of experience across the healthcare industry, including time spent in clinical practice, as a managed care executive, a biopharmaceutical medical director and a healthcare writer. He comes to Next IT from Genentech, Inc., a biotech pioneer, where he worked as a Physician Executive. In his role as Next IT’s Chief Medical Officer, Dr. Morrow will advocate for outcome-improving innovations in patient care and adherence and will bring new perspectives to the medical industry for best utilizing Next IT’s proprietary virtual health assistant technology. He is a sought-after speaker and has given hundreds of lectures on topics including pharmacy management, medical management, disease management, specialty pharmacy, genomics and biotechnology. Morrow has authored nearly 200 publications in a variety of peer and trade journals and has been a major contributor to a textbook on managed care. He writes the provocative monthly column, Tomorrow’s Medicine, for Managed Care, an online magazine widely read by health-plan executives and physicians. He also serves or has served on the advisory boards for six journals and several not-for-profit organizations.

Rethinking online health information: How about personalization?



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ABSTRACT: Dr. Howard Koh, Former Assistant Secretary of Health and Human Services (HHS) explained, “While [health literacy] may not necessarily attract headlines, it is absolutely at the core of everything we do as health care... professionals.” Yet making health information that is searched for on the Internet accessible means not only reducing jargon but also reducing volume. Personalization is one answer that Medivizor, a start-up featured in *Forbes*, has developed to answer the need. Hospitals and providers partner with Medivizor to improve the health literacy of patients, enhancing engagement and collaborative decision-making.

In two different editorials, one from 2005 and one from 2010, Google searches made by parents (1), in one case, and a Fellow in Dermatology in the other (2), resulted in correct diagnoses of rare disorders. One physician worried, “William Osler... must be turning over in his grave... Are we physicians no longer needed?”(2)

In another case, described in a 2013 letter to the editor of the *Netherlands Journal of Medicine*, a Google search was the resource for physicians who were able to save the finger of a young healthy woman, bitten by a brown recluse spider. (3)

Studies followed the 2005 editorial, to compare the ability of non-physicians with physicians, to conduct Google searches and correctly diagnose. The non-physicians took longer to search the web and performed worse than the physicians: thus confirming that physicians still have an important place in medical diagnosis. (4)

But, undoubtedly, since then, the marvel that is the Internet has helped countless numbers of people in diagnosis and treatment. Turning to the Internet for health information is not just a pastime, it is a phenomenon and perhaps a necessity.

Who are Internet Users?

The Pew Research Center for Internet, Science and Tech has been surveying people in the US on their Internet usage since 2000. In 2000, young adults were the main users (70%) and their usage has increased to saturation today. Use of the Internet by seniors has grown from 14% in 2000 to a finding of more than half of all seniors being on the Internet today. In addition, those with higher education have led the number of users: 78% in 2000 and 95% in 2015. There has been significant growth among people with less education (a high

school diploma) since 2000. Then, only 19% were using the Internet, whereas now 66% are using it. In 2015, those with higher annual incomes, \$75,000 and above, are the most likely to be using the Internet (97%) as opposed to those making less than \$30,000 (74%). (5).

What are the Characteristics of Internet Health Information Seekers?

Although the vast majority of health information seeking for people with and without chronic conditions involves face to face or off-line interactions with clinicians (with 81%, without 62%), friends and family (with 65%, without 56%) and those who share a diagnosis (with 27%, without 23%), there are people who are going online for health information.

In a 2012 nationwide telephone survey of 3,014 adults living in the United States, seventy percent of Internet users, no matter their diagnosis, sought health information online during the past year, according to Pew.

The same survey revealed that 35% of adults had tried to go online to figure out a medical condition for themselves or someone else. Almost half (46%) of these online self-diagnosers were motivated by their research to get medical attention for the person they were diagnosing. (6)

Having Multiple Chronic Conditions

There has been interesting research on motivators for Internet health information seeking. According to the Pew Internet Health Tracking Survey of 2012, multiple chronic conditions played a role in people searching online for “specific disease or medical problem, a certain medical treatment, and drugs” compared to Internet users without chronic conditions. (6)

Being A Caregiver

That same survey in 2012 revealed that around 40% of US adults are caregivers of adults or children with disabilities. These caregivers are on the Internet (86% versus 78% non-caregivers) and they (84%) are online researching medical procedures, health insurance and drug safety. Fewer non-caregivers (64%) conducted online health research. (7)

In a 2014 survey of caregivers for people with dementia, over half (59%) self-identified as health-related Internet users. Those who were health information seekers were younger, had higher education levels, spent less time caregiving, and experienced higher levels of emotional stress and financial hardship than those who did not seek health information on the Internet. (8)

Lack of Access to Care

In the US, results from the US National Health Interview Survey indicated that people with less access to health services were more likely to search the Internet for health information. These access issues revolved around not being able to get an appointment soon enough, physician's office not being open when they could go, or the physician not accepting new patients or not accepting their insurance. (9)

Why is Internet health information seeking important to hospitals, physicians and healthcare in general?

Push To Improve Technological Skillsets

Though perhaps less important for Western European nations, in the US, a push is underway to increase patient engagement with technology as well as interaction with and communication among physicians, nurses, pharmacists, hospitals, and public health entities. This is being moved forward via new government regulations in Medicare and Medicaid called Meaningful Use. These rules require implementation of electronic health records and technology to engage patients and share health care information. Internet use and familiarity with technologies can only help in moving this forward. (11)

Importance of Health Literacy

Howard Koh, MD, said that health literacy is not glamorous.. However, Koh, as a professor of the practice of public health leadership at the Harvard School of Public Health and former HHS Assistant Secretary also said "...it is absolutely at the core of everything we do as health care and public health professionals." (12)

Koh continued, "A major gap looms between what providers intend to convey and what patients and families understand...The central question is, what does it take to have the capacity to process and understand health information in order to make appropriate health decisions? That is the heart of health literacy."(12)

Koh described a typical patient scenario in the US at present:

"Mrs. Jones is without insurance and on a fixed income, and she suffers from diabetes and heart failure. She arrives a half-hour late for her appointment because the hospital signage confused her. Her confusion increases when she cannot understand the pile of forms the receptionist hands her. It rises even further in the examination room

when she cannot understand the medical jargon that her provider uses. At that point, she is too overwhelmed to ask any questions and the doctor leaves her with a handful of prescriptions that she does not understand and referrals for laboratory work that she cannot quite comprehend. Not surprisingly, she fails to obtain the laboratory tests and some of her prescriptions go unfulfilled. Eventually, she ends up being hospitalized, treated, and discharged, again with little understanding of what she is supposed to do to best care for herself."

While in health literate scenario of the future, Koh stated,

"...Mrs. Jones would receive a call prior to her appointment telling her to bring all of her medications to her appointment. A health-literate organization would provide her with forms that she can understand and help her fill them out if she has questions. A medical assistant would review medications with her and make sure she truly understands how to take them. Her physician would present treatment options in a way that would enable the two of them to create a care plan that Mrs. Jones could explain in her own words. When she got home, she would be connected to a diabetes peer support group near her home that would help her practice prevention." (12)

To reach this future, goal, Russell Rothman, director of the Center for Health Services Research at Vanderbilt University, described a list of 10 attributes of a health-literate organization.

1. "Has leadership that makes health literacy integral to its mission, structure, and operations;
2. Integrates health literacy into planning, evaluation measures, patient safety, and quality improvement;
3. Prepares the workforce to be health-literate and monitors progress;
4. Includes populations served in the design, implementation, and evaluation of health information and services;
5. Meets the needs of populations with a range of health literacy skills while avoiding stigmatization;
6. Uses health literacy strategies in interpersonal communications and confirms understanding at all points of contact;
7. Provides easy access to health information and services and navigation assistance;
8. Designs and distributes print, audiovisual, and social media content that is easy to understand and follow;
9. Addresses health literacy in high risk situations, including care transitions and communications about medicines; and
10. Communicates clearly what health plans cover and what individuals will have to pay for services."

Internet health information seeking, guided by healthcare institutions and providers, can help to fulfill guideline numbers 7 and 8. (13)

The Vast Spectrum of Desire for Health Information

Of course, there is variety in desire for information. Koh, early

in his career treating cancer, learned that he needed to know his patient's level of understanding of her condition. He also discovered that there was a range of interest in his patient's desire for information. Some of his patients had read everything they could about their disorder. Others were "scared and paralyzed by the information." (12)

What are the barriers to good information?

A Google search of "Breast Cancer" yielded about 98,000,000 results and a search on "Prostate Cancer" yielded about 22,500,000 results. Sorting through pages and pages of information, not knowing what is trustworthy or even relevant to the situation, wastes time and energy.

Even if a health information seeker only focused on PubMed, they would find huge numbers of medical journal articles. For physicians and other providers, keeping up-to-date on research can be a daunting task. (See Table 1) (14) The total number of published medical journal articles catalogued by PubMed in 2012 was 1,076,469 in 2013, 1,137,508 and so far for 2014, 1,183,699. And PubMed does not catalogue all medical journals. (15)

Number of PubMed Catalogued Articles by Year and Condition

Condition	Number of Articles Per Year Published		
	2012	2013	2014*
Breast Cancer	13628	13584	11602
Prostate Cancer	6702	7029	5943
Lung Cancer	9163	9886	8763
Colorectal Cancer	9167	9556	8476
Coronary Artery Disease	4008	4325	3272
Diabetes Mellitus	18613	19317	15857
Hypertension	7566	7698	6344
Infertility	2307	2283	1817
Lymphoma	5061	4977	4245
Melanoma	3659	3734	3316
Rheumatoid arthritis	3763	3637	3029
Stroke	8424	9210	7665

*It takes approximately 1.5 years for National Medical Library to catalogue all publications. Cataloguing is not complete for 2014.

The Need To Find Reputable Internet Health Content

Physician, Dr. Luc Colemont, Specialist Gastroenterology at St. Vincentius Hospital in Belgium, tweeted in February, "In 2015 people are still dying because of a lack of information." (16)

A October 2014 article in Forbes stated, "there is still a serious need for patients to access in-depth information about the conditions that doctors have already diagnosed." The article

recommended award-winning Medivizor. (17)

Medivizor is an online, HIPAA-compliant, health service that combines patent-pending personalization technology with plain language translations of cutting edge medical journal articles to fill this gap.

As a health literacy resource, Medivizor partners with hospitals and physician practices. Providers use Medivizor not only to facilitate communication with patients but also to keep up with the literature.

Medivizor doesn't only seek to provide basic health literacy – it actually empowers both patients and their providers by making accessible all the cutting-edge science that is personally relevant for each individual. By leveraging knowledge of an individual's medical profile--including all primary illnesses and co-morbidities, treatment history, and personal preferences--Medivizor brings to the fore all the clinically relevant research, updated guidelines, and matching clinical trials. The system is further infused by the wisdom of the crowd, leveraging all actions and interactions by system stakeholders to help affect the content curation.

In this way, Medivizor is another tool to improve the health literacy of people worldwide.

Well before the world will experience broad adoption of personalized and precision medicine, we firmly believe that health information can be personalized to each individual based on their medical profile as well as their health literacy. In other words, health information, personalized.

BIOGRAPHIES

Tal Givoly, has over 25 years of product development experience holding leadership positions in technology, innovation, research and development, with a proven track record in "realizing visions" in startups and other corporations. Before Medivizor, Tal was Chief Scientist at Amdocs (NYSE: DOX) and led innovation activities across the company including heading up Amdocs' technology incubation unit and open innovation programs (2004-2011). Tal is a prolific inventor with over 25 granted patents and many more pending. He is recognized for his passion for, and expertise in, innovation, being invited to speak at major industry events such as Stanford Medicine X, Digital Health Summit, CE Week, Consumer Electronics Show (CES), Mobile World Congress and CTIA. He was also actively involved in industry forums and standard bodies including the TM Forum, IETF, ATIS, and IPDR.org. Tal was a director on the board of IPDR.org and TM Forum. He holds a Dual B.Sc. Cum Laude in Mathematics and Physics from Tel Aviv University.

Kathleen D. Hoffman, is the Social Media Specialist and Blogger in Residence at Medivizor. With her background in Health Communication she provides social media services, writes press releases, white papers and blog content for specialty pharmacies and health care start-ups. Kathleen holds a PhD in Communications from the University of Alabama, she has a MS in Public Health from the University of North Carolina at Chapel Hill and a MS in Television and Film from the Syracuse University.

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No turning back – prospects and challenges of eHealth



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ABSTRACT: eHealth is a term referring to tools and services using information and communication technologies (ICTs) that can improve health care in many ways, such as prevention, diagnosis, treatment, monitoring and management. The small ‘e’ in front of the eHealth (original abbreviation for “electronic health”) has been given several meanings: ‘e’ also refers to efficiency, empowerment of patients, evidence-based health care, enabled cross-border communication, and equity access to services, for instance. Furthermore eHealth includes the attitude and commitment to networking and global way of thinking. The purpose of the article is to describe the many-sided eHealth, prospects and challenges, changes in roles of health care staff and patients, and to encourage discussion.

INTRODUCTION. Healthcare sectors have increasingly sought to utilize eHealth systems that use information and communications technologies (ICTs) to widen access, improve quality and increase service efficiency. This is especially so at current times when all health systems face huge economic challenges and greater demands to provide more and better care with less money. (1)

According to WHO and European Union programmes eHealth means concrete real-time monitoring of an individual’s health; treatment support; health advice and medication compliance; accessing and sharing health information to practitioners, leaders, researchers and patients; health decisions based on reliable evidence-based information; health education and awareness programmes; accelerant diagnostics, global communication

for health-care workers. More precisely eHealth effects many areas of healthcare and includes information and data sharing between patients/clients and health service providers, hospitals, health professionals and health information networks; electronic referrals and discharge letters; electronic health records/personal health records (EHR/PHR); portable patient-monitoring devices; operating

room scheduling software; automatic staff clothing delivery system; storage and delivery automation for pharmacies and hospitals; meal ordering; robotized surgery and blue-sky research on the virtual physiological human, in which scientists aim to understand the world around them. (1, 2)

In Figure 1 The many faces of eHealth is an attempt to capture the multifaceted nature of eHealth (3).

FIGURE 1: THE MANY FACES OF EHEALTH (4)



eHealth is closely related to informatics and health literacy which simply mean the capability to use ICT tools, and the degree to which a patient/client has the capacity to obtain, communicate, digest, and understand basic health information and services in order to make appropriate health decisions. (4) People most likely to experience low literacy are elderly, ethnic minorities,

people with low income levels, and non-native speakers of English, the main eHealth language. In conclusion education, language, culture, access to resources, and age are all factors that affect a person’s informatics and health literacy skill. (5). The world is divided. Most of the internet users still live in industrialised countries and benefit most from new eHealth solutions, and less fortunate people cannot benefit from digital resources. According to research the divide is similar to the global health divide, where the majority of global resources go to health in developed countries. Increasingly, literacy is viewed as including a variety of skills needed for an adult to function in society. (5, 6) However with the use of multi-format solutions, using voice, pictures, video clips or graphics it is possible to combat illiteracy, and disseminate health education and healthcare, for instance.

There is ongoing change from hospital-centred care towards patient-centred care

Patient-centred care is a key component of a health system that ensures that all patients have access to the kind of care that works for them. Patient-centred care includes e.g. Respect for the patient’s/clients values, and expressed needs; access to care; involvement of family, and smooth coordination of care. Although these dimensions were originally applied to hospital-based care, they could apply equally to care in the ambulatory sector. eHealth has a strong emphasis on patient/client empowerment. This has been catered for in Nordic countries, Denmark, Finland, Iceland, Norway and Sweden, where eHealth is strongly supported in national health strategies. According to surveys done by European Union the Nordic countries are leading countries in Europe, in terms of eHealth service availability. (7, 8) Furthermore one Nordic analysis of the national policy documents revealed a strong similarity between the Nordic countries. All national eHealth policies contained statements about improving quality, effectiveness and patient empowerment in healthcare services, as well as improving information security, access to relevant health information, privacy, and secondary use. (7, 8, 9)

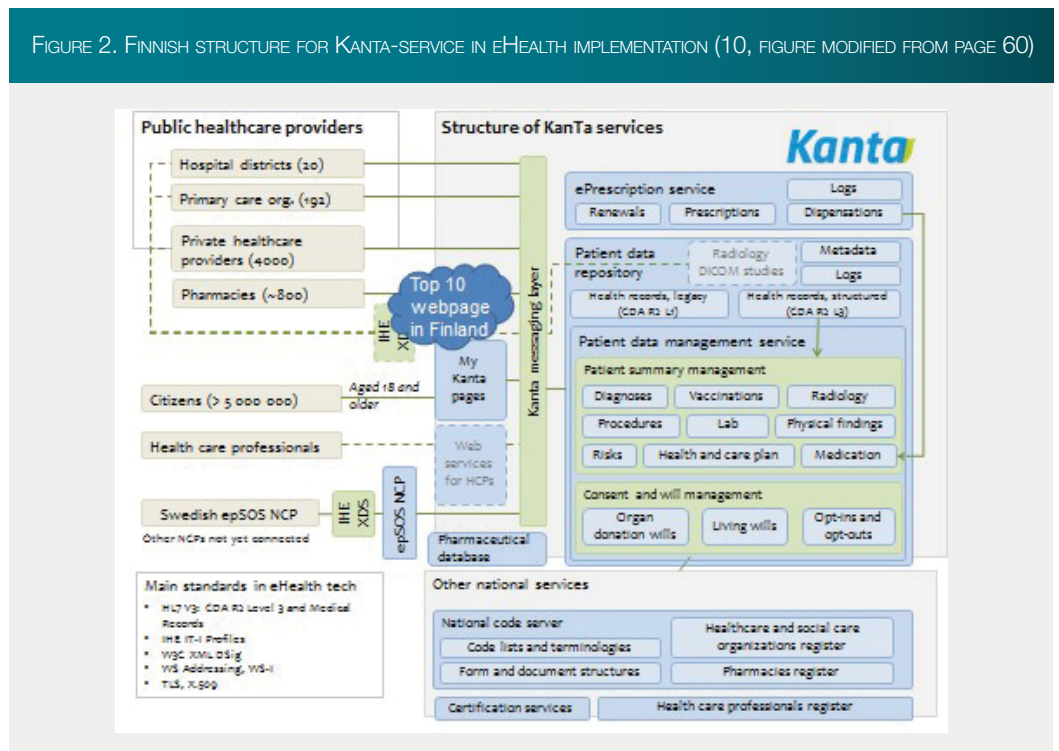
eHealth infrastructure building– case Kanta services

Examples from Finland show how patient/citizen-centred services are built upon a national infrastructure. The Finnish eHealth structure has three main areas, which are national health record archive, national electronic prescription system and a web portal to personal health information for citizens. Together these three parts form the foundation of the national archive of health information known as Kanta services.

The Ministry of Social Affairs and Health of Finland (MSAH) is responsible for implementing the Kanta project. There is 100% EHR coverage in both specialised and primary care on a local and regional level. Finnish legislation is guiding all main activities, and the roles in national, and even both organisational and cross-border settings are defined by law e.g. National Institute for Health and Welfare (THL) is responsible for operational management and Social Insurance Institution of Finland (Kela) for technical deployment.

One leading principle of Kanta services is to store and manage national healthcare information in a centralised system. The architecture defines the centralised information model and principles of software design, for instance. Figure 2 below gives a compact insight of national architecture, required legal changes and practical examples of services, both to professionals and patients/citizens. (10, 11).

FIGURE 2. FINNISH STRUCTURE FOR KANTA-SERVICE IN EHEALTH IMPLEMENTATION (10, FIGURE MODIFIED FROM PAGE 60)



My Kanta pages are for the patients/citizens. So called eView gives information from the eArchive and ePrescription centre. My Kanta pages are meant for adults, from age of 18 years. Access happens via internet. The log data

are based on identified users (personal certificate card). Also the individual's consent and denials are dealt with in Kanta. Furthermore a living will can be executed via the service. Today Kanta services are well-accepted and the webpages are among the top ten of Finnish portals. (See Figure 2).

Finland is member state of European Union. Citizen's mobility and increasing freedom of choice also require cross-border exchange of information and closer European level cooperation in information management. National deployment requires mature assets. It is not possible to introduce a cross-border service at national level if the service is significantly different from the national standards. In Europe the epSOS (Smart Open Services for European Patients) is aimed to design, build and evaluate a service infrastructure that demonstrates cross-border interoperability between electronic health record systems in Europe. Pilot epSOS supported the convergence of the eHealth progress in the EU by cooperating and providing the eHealth network with the epSOS data set of the Patient Summary and by working on the topic of semantic sustainability especially in the context of ePrescriptions. Thus, epSOS developed and helped the process towards interoperable cross-border healthcare in Europe. (11, 12)

Prospects of eHealth

ICT systems for clinical use are crucial for effective care. Healthcare staff need decision support systems, EHR, ePrescription, Radiology Information Systems e.g. the well-functioning PACS (Picture Archiving and Communication Systems) digital images allow health care staff to zoom in on images and manipulate them for better viewing and analysis, the system helps reduce the number of duplicate images since previous results are available electronically, improving data for management efficiency, and the system facilitates quick and easy access to patient images and reports, even in remote areas.

eHealth saves travelling costs, and the patient/client can access healthcare services 24/7. This means that eHealth can reduce the time required to perform health tasks and processes. eHealth improves the quality of data held in healthcare systems. Furthermore this can make for better-quality health decisions and actions both at the operational level and at the managerial level. Via access to knowledge bases both healthcare staff and patients learn, have better skills to provide care. National and international networks provide information, share information with peer or other groups. Social media has shown its power, too.

Challenges

Potential risks to eHealth are data ownership and use, privacy and security, attitudes of patients and health care professionals to new developments, and interoperability of systems. Old ICT systems still exist. Also the rapid development and advertisements nurture unrealistic

expectations from eHealth. The line between a patient connected to healthcare and independent consumer is vague. There is a need for regulations e.g. what are the applications which can be connected to healthcare information system. The growing amount of data, big data, is a huge challenge. How we can utilise it for health purposes? Do we want surveillance in all spaces? In cross-border care the legislation on security and privacy, ICT architecture and use of eHealth should be harmonised. Health care staff do not want to change the way of working. What will happen when the patients have full access to their own records, and produce information? Do health decision support programs and tailored education programmes reduce the use of healthcare services. What is the role of healthcare staff when sensors sending information on patient say: you need to see the doctor. Can we rely on the gathered data or do we need repeat tests and results? New technologies and eHealth applications are developing at a rapid rate. There is still much to learn about how to use these technologies and harness the explosion of social networking to enhance health decisions.

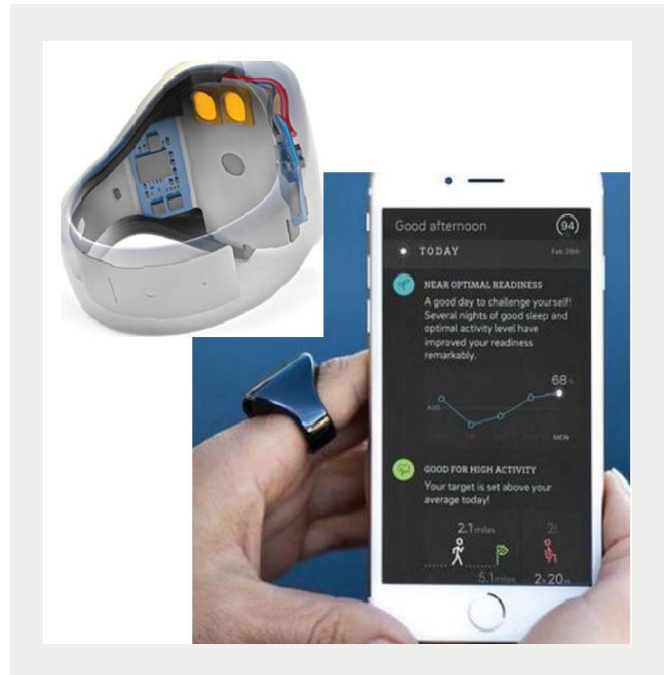
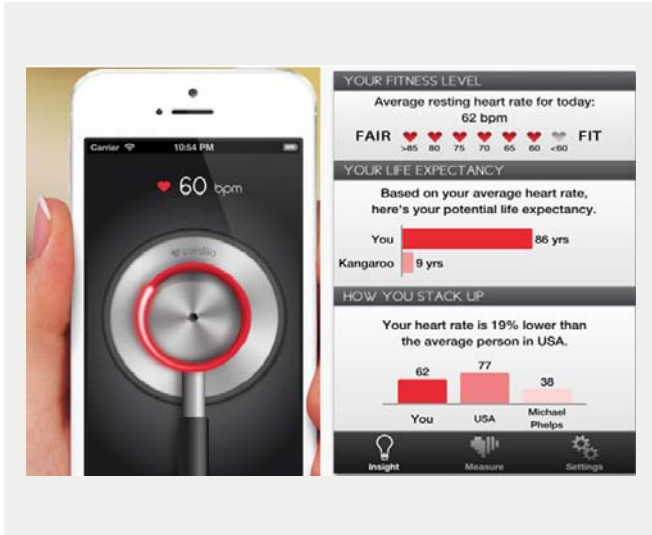
Examples of eHealth tools for health and wellness purposes

Tools remind people when it is time to take their medicine, and are suitable for people who have problems remembering to take their medication at the right time and for those who mix up their medications. The voice, light or a reminder call and a text message alarm regarding medication that is about to be skipped, for example.

There are tools for monitoring blood glucose working with mobile phone. <http://www.housemed.co/monitoring-your-health-with-mobile-devices/>



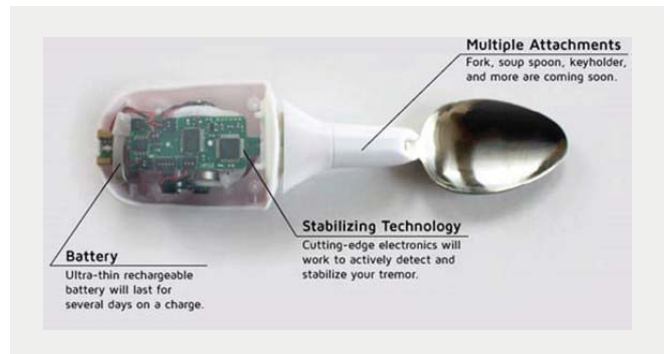
Touch-free heart rate monitoring. The Tool works by simply having a person look straight into the front camera of their iPhone/iPad to measure his/her heart rate from a distance. The Tool analyses the heart rate data to provide the person with a fitness level rating and also estimates a person's potential life expectancy. (<http://www.cardio.com/>)



Tools for personal use

The spoon is designed to help people with hand tremor eat more easily. <http://www.liftware.com/>

A blood pressure cuff works with an iPhone or iPad to track blood pressure over time and can send the data to a Web site. Source <http://www.housemed.co/monitoring-your-health-with-mobile-devices/>



Smart electronic fork , which vibrates and lights up to help its user slow down to a healthy eating pace. <http://voxix.com/2013/01/09/electronic-fork-changes-eating-habit/>

The ring measures and analyses the body and learns about personal lifestyle. The mobile app visualizes the measured data, offering personalized recommendations. It delivers a clear textual message flow showing the trends, details and changes over time. The ring is worn on a person's finger and includes a full-featured computer with sensors that access comprehensive physiological data to provide a long-term view on how the body and mind respond to sleep, rest and active life (<http://ouraring.com/>)



Electronic shorts collect real time information from your muscle activities e.g. Muscle Load, Heart Rate, Speed, Cadence, Balance, Route. Source: <http://www.myontec.com/en/>



An intelligent shoe can help many people to move from one place to another. A person sets his/her destination in the app, and lets shoe show the way through gentle vibrations. Source: <http://lechal.com/shoes.html>



Also there are intelligent glasses available to avoid pedestrians in the traffic.

Therapeutic robot, an animal, can be of great comfort and joy. The seal has five kinds of sensors: tactile, light, audition, temperature, and posture sensors, with which it can perceive people and its environment. With the light sensor, the robot can recognize light and dark. It feels being stroked and beaten by tactile sensor, or being held by the posture sensor. The robot can also recognize the direction of a voice and words such as its name, greetings, and praise with its audio sensor. <http://www.parorobots.com/>

Due to explosion of healthcare applications there are new services which help citizens to find safe and trusted applications (13). In the future devices for discussing (Internet of Things) and producing information and surveillance is increasing.

BIOGRAPHY

Pirkko Kouri, holds a PhD in Nursing science from the University of Eastern Finland. She is a Principal Lecturer in Healthcare technology with Savonia University of Applied Sciences, Kuopio, Finland. She has over three decades of experience in health care ICT. She has several memberships: Member of eHealth Strategic Group at the International Council of Nurses; Member of Board of Directors International Society for Telemedicine & eHealth; Member of IMIA-Nursing Informatics Education Working Group and Secretary of the Board of Finnish Society of Telemedicine and eHealth, vice-chair of the group writing The National eHealth Strategy for Finnish Nurses, and as a voluntary worker she is the Chair of the Regional Cancer Association.

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If these walls could talk: utilizing health data from the home to reduce unnecessary readmissions



ROBERT M. HERZOG
FOUNDER AND CEO OF ECARING

ABSTRACT: In the post-Affordable Care Act (ACA) landscape, comprehensive care management has become an essential component in the universal goal to reduce hospital readmissions and their associated costs. Utilizing real-time home health monitoring technologies, hospitals can transform transitional care from hospital to home while significantly improving long-term home care outcomes. To achieve the Institute for Healthcare Improvement's Triple Aim, we need widespread commitment and investment in home healthcare IT that connects clinicians, providers, and payers to patients with speed and accuracy. Technology that generates real-time actionable health care data from the home is an essential key to progress in this endeavor.

When it comes to gathering valuable data about the health of elderly individuals with multiple chronic health issues, there's no place like home.

We are experiencing a time of tremendous change in the health care industry. Fueled by the ACA, the push to managed care, value-based payments, capitated rates, CMS penalties and policies, Medicaid Redesign efforts, and the unrelenting realities of demographics and economics, we face the necessity of making basic changes in how care is administered, managed, monitored and integrated if we are to achieve the goals of lowering costs and utilizations while enhancing care quality for the neediest segments of our population.

For example, in New York State, dual eligibles (seniors that qualify for both Medicare and Medicaid assistance) make up 15% of the Medicaid population, yet account for 39% of total Medicaid patient costs¹. On a national level, there are more than nine million dual eligible patients that cost over \$250 billion a year², among them, 55% live with three or more chronic illnesses³.

The 2012 Medicare Readmission Reduction Program coupled with tighter budgets for states and managed care organizations, stricter capitation rates, and ever-increasing service costs make care management across the continuum of care a critical component for maintaining patient health.

These changing requirements and trends are why there needs to be an overall commitment and prioritization from the healthcare community to invest in home healthcare

information technologies that connect clinicians, care providers and coverage payers with patients. By providing payers, plans and providers with real-time monitoring of chronic conditions common to the aging population, we will fill a critical void in today's ACA. Technology that supports real-time health monitoring in the patient's home has the potential to revolutionize transitional care from hospital to home as well as improve long-term home care outcomes enormously.

A patient's home is an untapped data resource that can provide insights into the patient's current conditions and behaviors to help identify and respond rapidly to health issues as they emerge, rather than after they have seriously escalated. Even when professionals are a part of the care support team, the home can become a "black box" where aides clock in for duty but document their visits in uncoordinated and unproductive ways.

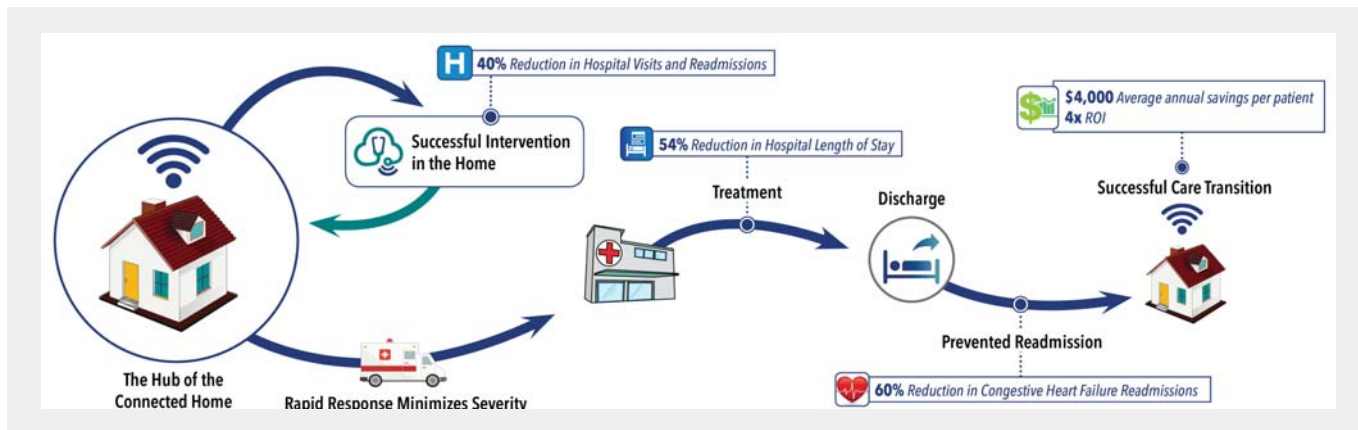
For many elderly people with long-term care needs, monitoring blood sugar and blood pressure levels, keeping track of weight gains or losses, observing symptoms associated with dehydration, infection, depression and other health concerns is done by family caregivers or home health aides. There is little standardization of what needs to be monitored, and often, each entity supporting a patient functions within a different "language".

With the help of technological tools, which can range from smart sensors and telemonitoring to interactive systems such as eCaring that collect extensive

unstructured human touchpoint data, the “black box” of healthcare monitoring can be transformed into a matrix of data where home health aides and family caregivers can input 500-1,000 data points per month, which can be used to respond rapidly to situations and trends requiring immediate attention, keeping small problems in the home from escalating to big ones requiring hospitalization.

by eCaring, dramatically increases the ability of aide and patients to enter significant and actionable data as events are taking place. Caregiving shouldn’t be about spelling and grammar — icons easily communicate information, overcome language barriers and technophobia, and are enjoyable to use.

New York’s Beth Israel Medical Center, as one example,



Here are eight key benefits that can be achieved by prioritizing the collection and utilization of real-time home health data in 2015 and beyond:

1. Bringing the Internet into the home to shed light on the “black box”.

Often overlooked in a country where 58% of Americans have smartphones is that the neediest and often costliest health care users often fall below the poverty line and have no Internet access in their homes.

This lack of connectivity leads to a “black box” effect, inhibiting a care team from having access to or knowledge of the significant events taking place in the home every day that lead to the costly use of health services. Bringing the Internet to the homes of America’s most expensive users, who are often low-income seniors that qualify for both Medicare and Medicaid assistance (“dual eligible”), quickly transforms the home into a rich source of meaningful data. With Internet access, seniors and their caregivers can transmit important patient data in real-time to care managers and doctors, as well as open the world of the Internet to the homes of the many that the “Information Super Highway” still passes by.

2. Creating a universal language for healthcare communication through the use of recognizable icons and symbols.

Just as important as the establishment of the Web in the home is functional access to technology by creating systems that can be quickly understood by the home health aide, patient and family, each of whom have varying levels of computer skills and English literacy limitations. Traditional systems used to record activities, such as phone, fax and paper, have limited utility, are cumbersome and error prone.

Using icon-based systems, such as the one provided

saw the value of an icon-rich software system for reporting real-time results of patients with congestive heart failure (CHF). As one of the nation’s leading cardiovascular care providers, Beth Israel enrolled a group of its patients with CHF in a real-time monitoring post-discharge program to assess the impact on reducing readmission within 30 days. Beth Israel requested CHF-specific easy-to-understand icons, care management tools, and a tracking component for each patient participating in the trial.

Beth Israel learned that the system’s new icons eliminated any language barrier, while ensuring quick input of key data on the patient’s weight, medication regimen, behavioral patterns and vital signs.

3. Creating a continuum of care through improved communication.

Better, consistent data from the home allows for sharing of patient information across the entire care team, including care managers, providers, hospitals, and health plan coordinators. This continuous stream of communication provides the best means to engage the home care worker and patients, who are more likely to provide data input if their care team responds in a timely way.

Knowing that “someone was there” and “I am not alone” helps patients cope and adhere to the plan of care prescribed by their physician. The continuum of care system also empowers patients to have increased responsibility for their own care and make informed decisions about the services they require.

4. Modifying monitoring to meet the critical needs of a particular patient population.

One of the leading causes of readmissions is CHF, followed by pneumonia, chronic obstructive pulmonary disease (COPD), urinary tract infection, and diabetes. Heart failure can often lead to

comorbidities, including dementia, renal failure, and hypertension.

Heart failure affects nearly 6 million Americans annually, with 550,000 new patients diagnosed each year. Four out of every five cases of heart failure occur in older adults. CHF is associated with over 1 million hospitalizations annually. The majority are readmissions or re-hospitalizations. CHF is in part responsible for close to \$35 billion that is spent on heart failure each year. To reduce the risks associated with CHF, real-time monitoring can be utilized to track sudden weight gain, swelling of ankles, shortness of breath, chest pain, severe fatigue, loss of appetite, frequent nighttime urination, rapid heartbeat and other critical factors.

5. Tracking critical activities, vital signs, medications and mental and physical states to help address problems before they lead to hospitalization.

Using real-time data, members of the care team can quickly spot changes or new trends that require immediate attention, keeping small problems in the home from leading to visits to the ER.

In the case of Beth Israel, data inputted by the home aide or the patient was quickly uploaded to the Cloud where information was evaluated by a care manager. The program showed significant, quantifiable reductions. Beth Israel saw its average rate of 29% CHF patient readmissions drop by 60% to 10.5% for this trial population.

6. Sharing information, through 24/7 web access, lowers stress for patients, caregivers, and families.

Unstable conditions cause stress that can lead to a rapid heartbeat, immune system compromise, fatigue, and time off from work. Knowing that they can remain at home with the support of an entire care team at the touch of a button gives patients a greater peace of mind and sense of control over their situation and progress.

Longer stays at home increase comfort and lower stress as well as costs for patients, families, and caregivers. Caregiver stress is associated with over \$35 billion a year in business costs.

7. Using analytics by patient populations to improve risk stratification and assessment.

Most risk stratification programs are based on prior history and in-hospital experience, with generalized risk factors. Real-time post-discharge care data can substantially enhance assessments for determining readmissions and utilization risk. Analytics can also help predict outcomes of recovery while pointing to outliers that may need further attention. Harnessing analytics can also determine best next steps in a particular patient population, as well as assessing care management performance among providers and the sharing of best practices.

In the case of a UCLA study, analytics of remote monitoring for heart failure patients predicted associated medical costs, optimization of care, and reduction of overall readmission costs by 61.5%.

8. Improving time management of activities and expenses.

Tracking of actual vs. budgeted or reimbursable time is demanded by today's payers. Using technology rather than telephone or, even worse, paper time sheets, can reduce time spent on time entry and increase accuracy. Resources can be better managed, which is essential under capitated rate and value and performance payment systems.

The success of real-time monitoring in reducing readmissions for patients with CHF at Beth Israel has led to the development of different modules for the needs of other special patient populations. Among the patient populations being considered for real-time data monitoring modules are patients with developmental disabilities, COPD, diabetes, acute myocardial infarction, and other likely causes of readmission.

The proven success of new digital media tools that can be used in the home to significantly reduce hospital readmissions and lower overall patient long-term care costs is a bright spot on the emerging healthcare landscape. Scaling up the introduction and deployment of these home-based systems is a certain "homerun" for healthcare.

BIOGRAPHY

Robert M. Herzog, MA, is a pioneer in applying new media and technologies to develop companies and solutions to critical problems in healthcare, media, Internet utilization, energy and the environment. He is the **Founder and Chief Executive Officer of eCaring**, LLC, a Web-based home health care management and monitoring system that brings the benefits of digital record keeping and communications to the millions of Americans receiving home health care. Mr. Herzog has an extensive background in digital media and creative enterprises as an entrepreneur and executive. Mr. Herzog graduated from Williams College, and his primary professional interests include improving information sharing and reducing overall health care costs.

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Grasping the health horizon: toward a virtual, interoperable platform of health innovations



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ABSTRACT: The emergence of digital health, wearables, apps, telehealth and the proliferation of health services online are all indications that health is undergoing rapid innovation. Health innovation however has been traditionally slow, high cost and the commercialisation journey was not a guaranteed path to adoption outside the setting where it was developed whether in a hospital, university, clinic or lab.

Most significant with this new explosion of health innovations is the sheer volume. The startup revolution, mobile health, personalised health and globalisation of knowledge means that consumers are demanding innovations and are pulling health innovations through commercialisation with new modes of funding such as crowdsourcing and direct vendor purchases.

Our Australian team initiated a project to use machine learning, data mining and classification techniques to bring together and analyse this expansion of health innovations from all over the world. Following two years of data aggregation and quality analysis we present our findings which are applied to over 200,000 innovations from more than 25,000 organisations. Our findings have identified the dynamics and basis for a marketplace for health innovations that could assist innovators, health practitioners, consumers, investors and other health participants to research, evaluate and promote these innovations.

1.1 A turning point in health care

In the two decade period of post war reconstruction following World War Two, the health sector underwent a major expansion fuelled by governments greatly reducing their military mobilisations and greatly expanding their involvement in healthcare. This coincided with the great expansion of knowledge in biochemistry. The combination of the two expansions led to the development of the pharmaceutical industry, and a new drug pipeline that resulted in thousands of health giving and life saving innovations becoming available.

Since the turn of the millennium, there has been a large increase in health sector size and complexity, in part driven by internal dynamics of the health systems of wealthy countries, and the great expansion of the health sector in middle income countries. At the same time, since the collapse of the IT industry bubble, there has been a strong increase in information technology.

This shift in trends has led to a change in the nature of how new advances in health enter our lives. The former era was one-dimensional and top-down, with health almost exclusively produced by large industries or social policies. The technologies of the new era are empowering the smaller-scale, lower tech innovations that have an important role to play in the future of health. These valuable sources of innovations

have difficulty achieving adoption and the old system of implementation strains under the sheer variety and creativity of health innovations in the 21st century.

Innovation now comes from a variety of scales. Policy innovations and big pharma work at the largest scale improving health from the top-down. Hospitals, universities and clinics are coming up with innovations every day that can improve efficiencies and lead to new treatments. At the smallest scale individuals are taking control of their own health. These “middle out” and “bottom up” innovations have a difficult time competing in an interoperable, highly regulated health system. These innovations are also less eye-catching than their more expensive counterparts but provide real value through their higher impact per dollar.

This 21st century problem needs a 21st century solution, and just like last century we have a growing capability to deal with this problem. This is happening in a time of relentless globalisation and connectivity in which a virtual solution may be found.

1.2 Health innovation as a discipline

Advances in health are now so varied and frequent that a new discipline has emerged, “Health innovation”. This discipline studies the advancement of health innovations

globally with an overall goal to improve the rate, reliability and reduce the risk of getting a new improvement in health to the people who can benefit from it.

In the new discipline of health innovation, case studies are a common unit of research. For example, governments looking to support innovation look to case studies as a metric for the impact of research, much like they use scientific publishing metrics as a proxy for research. However, producing a case study can be quite challenging and expensive. Journal articles are highly prized in academia and so academics can be relied on to write them. In contrast there is little incentive, sometimes even a disincentive, for a commercialisation manager or entrepreneur to write detailed case studies of their own experience. That said, there is a wealth of information online about health progress, through which these case studies may be constructed.

2.1 Health Horizon project

With an intention to understand and eventually improve the health innovation process, we embarked on a project to understand the ecosystem through an extensive data exercise. We collected 200,000 records of data that we believe represent innovations from more than 25,000 organisations. In this article we will share some of our initial insights the data has provided and how we intend to use this to improve health innovation globally with a virtual, online environment.

With seed-funding from non-profit Health Intellectual Property (HIP), we gathered innovations from universities, hospitals, clinics, clinicians, non-government organizations, startups and funders, through major public internet sources, investment briefs, technology profiles and news stories.

Existing repositories of innovations usually focus on a single development stage and allow innovations from all domains. For example entries in IP trading databases record specific moments of progress in all natural and industrial sciences. Online directories exist of health companies that are often built on some health advance, but these sites are often also discipline agnostic. Trial listings and news reports show similar glimpses of progress at moments through an innovation’s life. But nowhere are these moments combined into a journey from conception to availability, in the spirit of a case study.

It also does not fit with the public conception of an innovation, which is why we believe that consumers are yet to fully engage with health innovation. Currently a consumer would need to follow many online sources to piece together the journey of the handful of innovations that interest them.

We believe that dividing up the innovation ecosystem across development stages is incompatible with the natural “case study” unit that has proved so useful in health innovation research and policy. Our approach is a cross cutting of this. We converted these flashes of news and temporary business profiles into discrete and persistent *innovations* for which the news and business are merely stages in its progress.

2.2 Results

The data we collected from multiple sources had a roughly consistent structure. Counterintuitively, this is made easy by reticent nature of publicising innovations. Because innovators are careful not to give away too many secrets, the information they give is minimal. This means the published information tends to be dense with meaning. Even news articles are mostly bloated press releases with all the required information appearing in the first paragraph – sometimes the first sentence “scientists at the [organisation] are developing a [innovation type] that [innovation function] and is currently at [innovation development stage].

To formally investigate the data we found it necessary to develop a new taxonomy in which to organise them. Building off other standards it was clear the taxonomy must transcend existing categorisation system such as the ICD10. This is because innovations do perform a medical function (which suits ICD10 or SNOMED) but exist in many forms (apps, pathways, campaigns, therapeutics, devices) and develop through time (IP protection, trials, distribution, availability) – both additional dimensions through which we wanted to interrogate the data.

Dimension	Consideration	Examples
Type	What is it?	Device, app, diagnostic, pathway, wellness campaign
Purpose	What does the innovation do?	Treat cancer, Manage diabetes, Improve education, Enable further innovation
Stage	How progressed is it?	Early stage, trials, IP protection, proof of concept, scaling, available
Target	Who benefits from the innovation?	Children, adolescents, orthodontics professionals, NGOs, caregivers

Table 01 – Our overall taxonomy captures the additional dimensions unique to innovation. Standard medical or health categorisations typically only consider purpose, for that reason ICD10 and SNOMED are nested under “Purpose”, and new categorisations were created under the others.

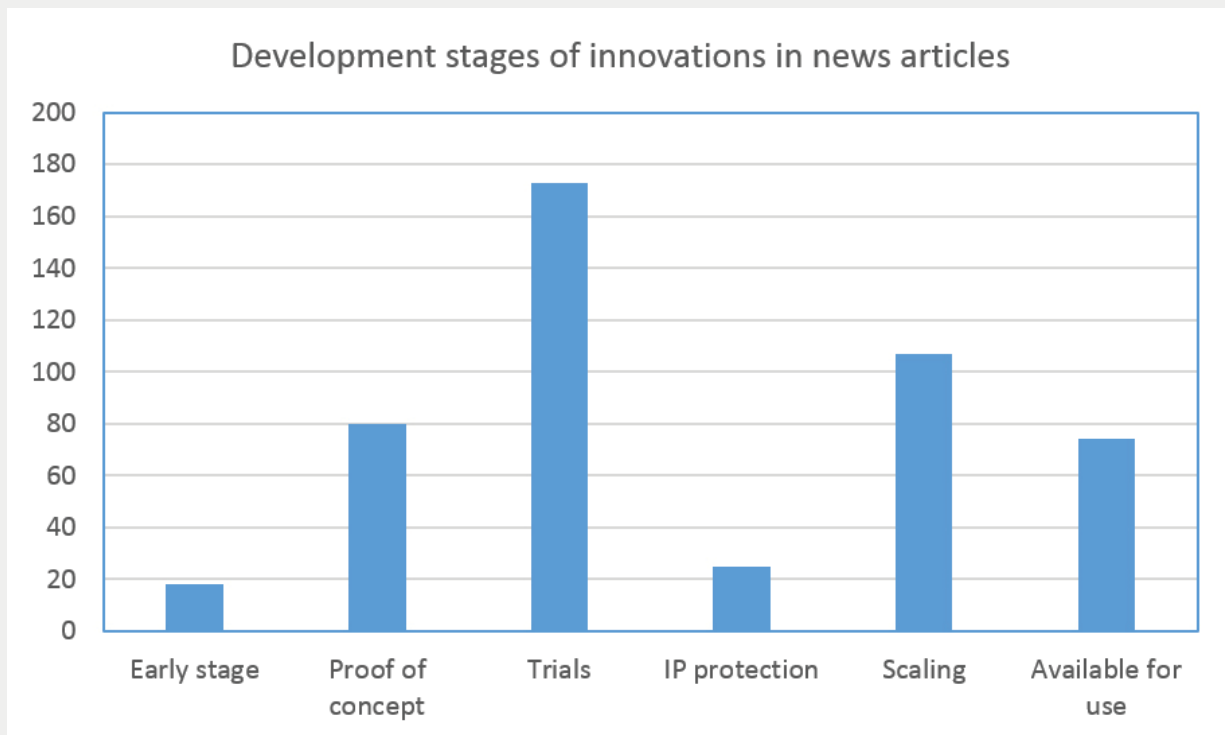
The data still had to be cleansed, for which we used a combination of machine learning algorithms and manual checks. By categorising them according to our taxonomy, the information became searchable under the four dimensions.

Some sources better than others. For apps, we can be quite confident that we have a representative sample owing to the iTunes and Google Play store consolidating the vast majority of the world’s apps. Generally the less-technical the solution (pathways, triage) the more difficult it was to find. The few repositories that exist are obviously

no-where near complete. There is also ambiguity about what constitutes an innovation in these spheres so good health advances may lie dormant forever in the current ecosystem.

technical or invasive solutions, without the resources that technical solutions tend to have. The CPAP Cap is a beanie for keeping babies' heads warm, reducing the complexity and cost of neonatal beds while providing a convenient scaffold

FIGURE 1 – FROM THESE SIMPLIFIED STAGES OF HEALTH INNOVATION PROGRESS, INNOVATIONS THAT ARE IN TRIALS WERE THE MOST COMMONLY PUBLISHED IN THE NEWS SITES WE SCANNED



We have come to the following definition of innovation that best suits the data. To classify as an innovation in our taxonomy, it must be both:

1. An improvement on the prior art

This separates it from accepted health practice. Our wording means that patent protected inventions are by definition innovations, but something doesn't need to be patentable to be an innovation. This definition conveniently builds in evidence, as proof that the invention is an improvement requires an evidence base.

2. Actively pushed by a person or organisation in order to spread its benefits

This requirement is necessary because of the preponderance of "ghost profiles": inventions and attempts at innovation that for some reason or another stop and don't update their online presence to reflect that fact. This requirement also fights patent trolls and other attempts to stifle innovation by buying up and holding intellectual property. We keep the definition loose with "spread its benefits" to capture both for profit and not for profit developments.

We have discovered a large diversity of ideas. Some, like the CPAP Cap are simple, cheap innovations that must navigate complex regulation that is built around more

to hold oxygen or monitors. The sheer variety of innovations boggle the mind: eye drops to dissolve cataracts, software for antibiotic stewardship (eASY), exercise programs for dads and kids to improve health and family bonds, emergency training modules, wearables to monitor biometrics, handheld poison detectors, repurposed cancer therapeutics, computer vision for neonatal monitoring, an online clinical animal trials register for people's pets and meta-reviews and evaluations of other innovations.

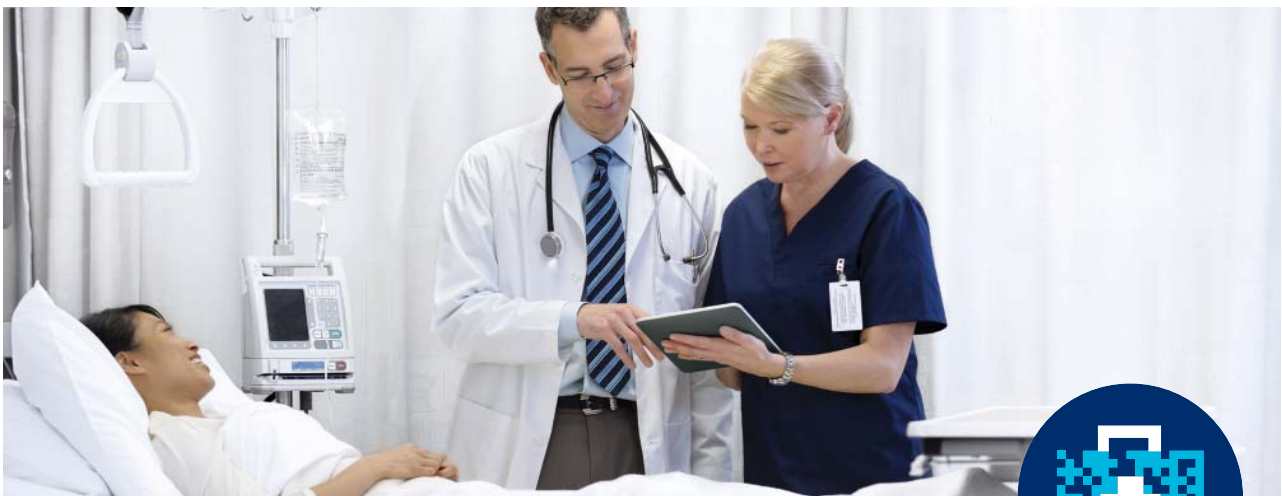
As part of our data exercise we scanned news websites for six months and categorised them into our taxonomy. The distribution of innovations whose development stages were explicitly mentioned is shown in Figure 1. The most common development stage for an innovation to be at when it appeared in the news was in trials. In this "scaling" refers to the process of getting the innovation out into the open, often through the vehicle of a company. For the purposes of this article we included innovations that were ready for market, but not necessarily available.

To provide an overview of the data, Figure 2 shows a word cloud generated off innovation descriptions from a 20,000 record subset of our data. It suggests a focus on patient-centric care. Many words communicate the technical solutions on offer, including "mobile", "platform", "software", "social" and "apps".



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Physician Collaboration – Now needed more than ever



SIMON SCHURR

CEO & CHAIRMAN OF COLLABORATIVE
MEDICAL TECHNOLOGY CORPORATION (CMTC),
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ABSTRACT: Driven by the changing reimbursement climate from volume to value-based, hospital systems must initiate technology and training to insure that communications between all HCPs involved with a given patient are coordinated and all test results and care plans are immediately available at every point of care in the system.

Since the enactment of the Patient Protection and Affordable Care Act (PPACA), there has been intense pressure on hospitals and health systems to reduce costs. Many hospitals are responding by merging and buying doctors' practices, while some are beginning to offer their own health plans for the first time and setting up accountable care organizations that would provide coordinated high quality health care for large groups of patients.

With new hospital mergers being announced weekly and more practices being added to hospital systems daily, the need to collaborate through virtual health initiatives is gaining strength. The addition of inexpensive secure telemedicine to the availability of an intelligent patient record form based on best practice guidelines will enable greater collaboration across the hospital system. This type of technology will increase revenues, cut costs, improve outcomes and increase patient and provider satisfaction.

Introduction

We are living in an amazing time for hospitals, their physicians and patients. Over the past few decades, innovations and advancements such as the use of robotics and precision equipment in the operating room, the development of interventional radiology, non-invasive cardiovascular procedures and the ability to perform MRI and CT are empowering doctors. Furthermore, with more effective new drugs and personalized medicine, patients are living longer and many previously terminal illnesses are managed as chronic illness.

Today, how healthcare is delivered in the U.S. is fundamentally changing. Since the enactment of the Patient Protection and Affordable Care Act (PPACA), there has been intense pressure on hospitals and health systems to reduce costs. Many hospitals are responding by merging and buying doctors' practices, while some are beginning to offer their own health plans for the first time and setting up accountable care organizations that would provide coordinated high quality health care for large groups of patients.

Moving from Volume to Value

The pressure for promoting change is the movement in the PPACA from a Volume to a Value reimbursement dynamic. Volume has been the traditional and incumbent payment mechanism whereby a healthcare provider and hospital is paid for each encounter. Value is the emerging payment mechanism, where a healthcare provider is paid on value provided. It should be noted that Value is a term used not only for the outcome, but also for the cost effectiveness of care. As a result of this payment scheme shift, from Volume to Value, there is the need for enhanced collaboration between healthcare providers.

The onset of pay-for-performance varies among markets, and

several payers in a region are necessary to make the transition efficient and worthwhile for providers. Health systems can align with employers, other providers and payers to build a critical mass. Providers also need to adjust their thinking about value-based reimbursement from the short- to long-term.

In its 2014 national study of payers and providers, McKesson¹ found 90 percent of payers already transitioned to some form of value-based reimbursement. Generally, providers are more reluctant to value-based care initiatives, such as accountable care organizations. Sixty percent of payers said they believe value-based reimbursement will have a positive finance effect on their organizations, while only 35 percent of healthcare providers believed the same.

Despite their feelings about new reimbursement models, both payers and providers agree they will soon eclipse traditional fee-for-service. Providers using mixed models expect fee-for-service to decrease from about 56 percent today to 34 percent by 2020.

In today's still majority Volume reimbursement environment, effective and efficient coordination of care is limited due to the lack of reimbursement. Said another way, there historically has not been substantial negative reimbursement consequences for poor coordination among healthcare providers. But as PPACA mandates continue to be implemented, the need for more coordination will be at a premium.

Technology to the Rescue

The integration of telehealth or telemedicine initiatives in mainstream care delivery to provide complementary or substitute care received a big boost from innovations

¹ The State of Value-Based Reimbursement and the Transition from Volume to Value in 2014. McKesson Health Solutions 2014.

in communication technology that has created more convenient, fast and affordable virtual interaction.
Deloitte on Virtual Health 2014²

Technology can be very useful with physician collaboration in care management. If handled properly, it can lead to an increase in new revenue opportunities, cut costs by improving physician productivity, improve the quality of care and outcomes and improve patient satisfaction. New revenue opportunities can come from attracting more referrals both from within and outside the hospital network. Following best in class treatment protocols and connecting the hospital network across all of its geography through telemedicine can cut costs and raise provider productivity. Improving diagnosis accuracy and speed to proper diagnosis especially for complex cases will lead to better patient outcomes at lower cost with lower re-admissions. All of these will combine for faster processing and happier patients.

An intelligent collaboration solution which can automate the process of “clinical information commerce” and provide Intelligent Operation and Management of Referrals’ authorizations and clinical information sharing/exchange cross borders and cross organizations is needed. Hospital systems that can enable care coordination with access to the appropriate interdisciplinary specialists flawlessly the first time, with no delay in care, will become the leaders of the future.

The Need for Care Management

Nearly one-half (49.5%) of total personal health care dollars are being spent on the top 5% of patients in the US today.³ These are the very complex cases, with patients who have multiple diseases and providers, where care management could enable great cost savings.

According to Thomas Bodenheimer, as published in The New England Journal of Medicine March 2008, “Patients with several chronic conditions may visit up to sixteen (16) physicians in a year. In these complex expensive cases, care among multiple providers must be coordinated to avoid wasteful duplication of diagnostic testing, perilous polypharmacy and confusion about conflicting care plans, not only for reducing unnecessary costs, but also for improving outcomes.”⁴ Value-based compensation as proposed by the Affordable Care Act, will require measuring costs and outcomes as determinants of how a healthcare provider (i.e., hospital, physician) will be compensated. Reimbursement will drive behavior.

Other relevant recent changes in the U.S. healthcare environment include:

1. A recognition of the impact of medical errors on patient outcomes and care cost;
2. The growth of patient self-directed care enabled by the Internet and hundreds of Advocacy groups;
3. Innovations in telehealth communication technology that has created more convenient, fast and affordable virtual interaction;
4. The rise of large self-insured employer groups; and

² *eVisits: the 21st century*, Deloitte 2014

³ Insights from the Health Care Transformation Task Force, July 2015

⁴ Coordinating Care — A Perilous Journey through the Health Care System Thomas Bodenheimer, M.D. New England Journal of Medicine. March 6, 2008

5. The realization of those self-insured employers and other commercial payors of the economic benefits of population health management services, providing employees/insured with various self-directed services such as telemedicine and diet and fitness services.

A common thread in all of these changes is the need to provide an intelligent patient record from disparate sources during the provision of care, allowing multiple levels of collaboration.

Critical and complex care situations as well as simple cases require patient medical records and images to be shared and accessed by multiple specialists. Due to the traditional fee for volume payment scheme, hospital systems and physician clinics are not well integrated within the same network or across non-affiliated networks. Lack of collaborative tools in the clinical setting is now seen as a large capabilities gap. And as healthcare continues to evolve to where care is provided across hospital networks, State lines and in different Countries, the need for collaboration will be critical.

Virtual Health is Coming

Innovator Hospitals that set up a secure infrastructure for clinicians to deliver care remotely will enable clinicians to be more efficient and make more informed clinical decisions in a timely manner, which increases quality of care and patient safety.

Deloitte on Virtual Health 2014

Virtual health provided through secure HIPAA compliant systems can be a convenient, fast and affordable way to interact with hospital-based specialists. Virtual health offers the potential to raise revenues, lower costs and increase efficiency while providing effective care management across the entire hospital system.

Specific best practice Virtual health capabilities should include:

- Delivers a turn-key virtual consultation and intelligent referral management capability that enables cross-enterprise referral management and authorization solutions
- Helps find the best doctor for diagnostic and treatment referrals, creating opportunities to give or get expert consultations
- Allows searches across a hospital system to be initiated by physicians, clinicians, administrators, payors and patients
- Provides a tool for creating a robust directory of preferred consulting physicians
- Allows organizations to manage multiple physician and specialty communities through a single resource
- Delivers robust search performance using semantic matching to target conditions, procedures, providers and service lines
- Enables physician-to-physician or patient-initiated requests for a medical second opinion regarding a diagnosis or treatment protocol
- Allows multiple specialists to be invited to consult on the same case
- Enables a customized consultation workflow with text

alerts for pre-determined critical parameters

- Facilitates collaboration and continuity via a secure communications engine

Intelligent File Sharing Needs

To enable virtual consultation for complex cases, hospital systems must provide both medical connectivity and relevant clinical information sharing.

Specific best practice file sharing capabilities should include:

- Delivers the most relevant and current patient data, according to standard or customized best practice protocols
- Permits clinical data and diagnostic image sharing via a structured-data template according to medical condition parameters
- Provides structured data capture and a secure exchange of clinical patient information
- Enables the exchange and sharing of diagnostic-quality images (DICOM) from remote and disparate systems into home clinical information systems from any location globally
- Allows access to images via a secure cloud-based network from any location with internet access
- Manages patient information via an integrated personal health record
- Allows integration of data from various formats, including electronic medical records, scanned documents or manual entry

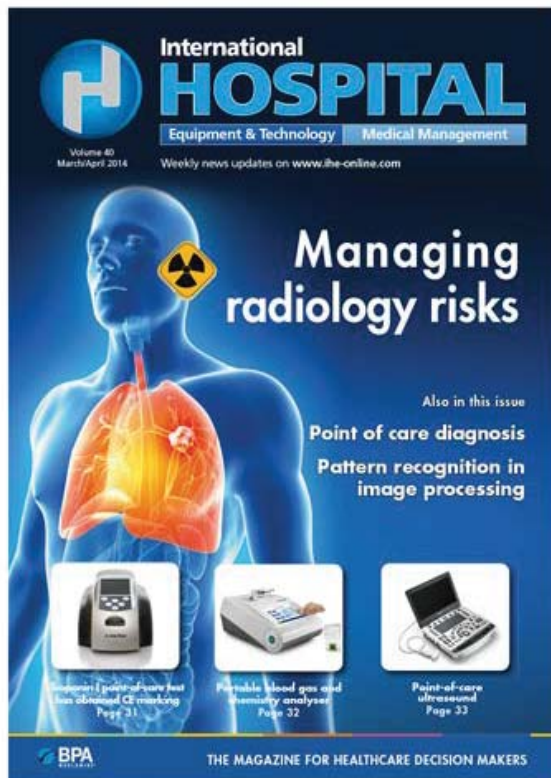
Conclusion

With new hospital mergers being announced weekly and

more practices being added to hospital systems daily, the need to collaborate through virtual health initiatives is gaining strength. Driven by the changing reimbursement climate from volume to value-based, hospital systems must initiate technology and training to insure that communications between all HCPs involved with a given patient are coordinated and all test results and care plans are immediately available at every point of care in the system. The addition of inexpensive secure telemedicine to the availability of an intelligent patient record form based on best practice guidelines will enable greater collaboration across the hospital system. This type of technology will increase revenues, cut costs, improve outcomes and increase patient and provider satisfaction.

BIOGRAPHY

Simon Schurr is a leading digital and connected health expert and has over 25 years of business management and entrepreneurial experience with a core focus in emerging global healthcare solutions. Schurr founded CMTC which specializes in developing diagnostic and treatment collaboration solutions using innovative cloud-based applications that provide telehealth/telemedicine capabilities. CMTC's Physician Collaboration Platform, developed at Columbia University Medical Center, enables hospitals and physicians to create, brand, and manage secure collaborative communities of clinicians/providers. Prior to founding CMTC, Schurr had several C-level roles at public and private companies. He holds a Master's of Science degree in Educational Technology from Lehigh University in Pennsylvania, and a B.A. in International Relationships and Business from the Hebrew University in Jerusalem.



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MASK-rhinitis, a single tool for integrated care pathways in allergic rhinitis



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ABSTRACT: Allergic rhinitis (AR) is among the most common diseases globally. MASK-rhinitis is a simple ICT tool to implement care pathways for allergic rhinitis from patients to health care providers using a common language and a clinical decision support system. This is based on the assessment of the control of allergic rhinitis by a visual analogue scale on an App and a tablet. MASK-rhinitis will allow (i) the patients to screen for allergic disease, (ii) the pharmacists, to guide them in the prescription of OTC medications and direct the uncontrolled patients to physicians, (iii) the primary care physician, to prescribe appropriate treatment and to follow-up with the patient according to the physician's instructions (CDSS) and assessment of control and (iv) the specialist and outpatient clinics in allergology, if there is failure to gain control by the primary physician. MASK-rhinitis will be important for establishing care pathways across the life cycle, stratify patients with severe uncontrolled rhinitis and to perform clinical trials.

Abbreviations

AHA: Active and Healthy Ageing
AIRWAYS ICPs: Integrated Care Pathways for Airway diseases
AR: Allergic rhinitis
ARIA: AR and its Impact on Asthma
CARAT: Control of Allergic Rhinitis and Asthma Test
CDSS: Clinical decision support system
EIP: European Innovation Partnership
ICP: Integrated care pathway
ICT: Information and communications technology

MACVIA-LR: Contre les Maladies Chroniques pour un Vieillessement Actif en Languedoc-Roussillon
MASK: MACVIA-ARIA Sentinel Network
QOL: Quality of life
RCT: Randomized control trial
RQLQ: Rhinoconjunctivitis Quality of Life Questionnaire
VAS: Visual analogue scale

Introduction

Allergic rhinitis (AR) is among the most common diseases globally (1) and ranks first in Europe (largely over 25% of the

European population). It exists in all age groups, and it often starts early in life (2) and persists across the life cycle (3). The burden and costs are substantial (4). It often impairs social life, work and school performance (5), and has a major impact on healthy ageing (6).

Several unmet needs have been identified (3). Although effective treatments exist for most patients, several unmet needs have been identified in allergic rhinitis: identification of the time of onset of the pollen season, optimal control of rhinitis and comorbidities, patient stratification, multidisciplinary team for integrated care pathways, innovation in clinical trials and above all patient empowerment.

1- MASK rhinitis: Allergy diary by MACVIA-ARIA

MASK-rhinitis is a simple system centred on the patient (3). It has been devised to fill many of the gaps using Information and Communications Technology (ICT) tools and a clinical decision support system (CDSS) based on the most widely used guideline in AR (ARIA) (7). It is a product of the European Innovation Partnership on Active and Healthy Ageing (8). MASK-rhinitis represents a novel tool to diagnose, stratify, and manage patients with AR and to assess treatment efficacy. It has the potential to have major impact on health policies and planning. In the future, the combination with biomarkers will further improve the impact of MASK-rhinitis.

MASK rhinitis is based on a daily measurement of rhinitis control using visual analogue scales. Measures of AR control include symptom scores, patient's self administered visual analogue scales (VAS) (7, 9), objective measures of nasal obstruction such as peak nasal inspiratory flow, acoustic rhinometry and rhinomanometry, a recent modification of the ARIA severity classification, patient's reported outcomes such as quality-of-life (QOL), scores with several items or composite symptom-medication scores. VAS integrates symptoms and QOL.

Mobile phone messaging facilitates the management of AR (10). By using cell phones with a touch screen, geolocalized patients can evaluate daily their symptoms daily by VAS. Daily, 4 VAS (global evaluation, nasal, ocular and bronchial symptoms) are completed by the patient on a cell phone (Figure 1). Moreover, medications are integrated in the application. The system is initially being deployed

in 15 countries with 15 languages (translation and back-translation, cultural adaptation and legal issues).

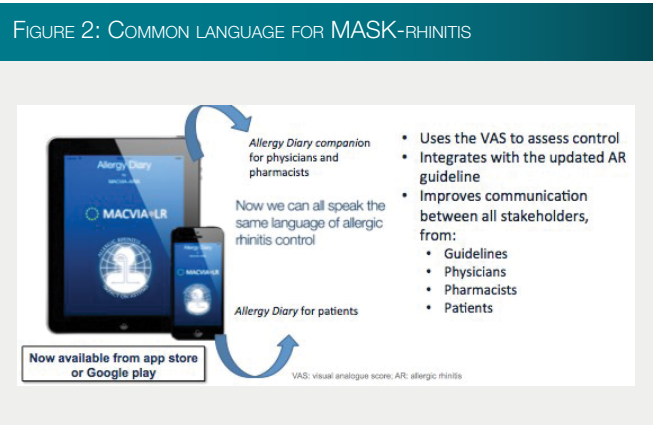
Information is sent to a clinical CDSS for an optimal management to all the patients. Identifying the most suitable patients for whom an intervention is appropriate is critical for the delivery of a cost-effective health system. In many diseases, the management of patients uses ICT tools including integrated care pathways, e-health and CDSS. This has made a significant improvement and has sometimes led to a change of management in health systems. A CDSS (11) immediately proposes advice for (standardized) pharmacologic treatment defined by the physician during a consultation before the pollen season.

MASK-rhinitis combines symptoms, QOL and treatment for an optimal AR control.

2- From a cell phone to a tablet: Allergy diary companion

A tablet computer, commonly shortened to tablet, is a mobile computer with a touchscreen display, circuitry and battery in a single device. In MASK-rhinitis, the mobile phone messaging is combined with the same program on tablets used by physicians, pharmacists and other health care professionals in order to have a single message from the patient to the physicians and to link AR control between all users (Figure 2). These tablets are in particular used in the allergy outpatient clinic of the Montpellier University Hospital. Patients and health care professionals will speak the same language concerning AR control in order to implement integrated care pathways (ICPs).

FIGURE 1: MASK-RHINITIS APP (FROM BOUSQUET ET AL (3))



3- MASK-rhinitis, a single tool for integrated care pathways

ICPs based on AIRWAYS ICPs (12) will guide the health care professional. An ICP has a focus on an interactive and multidisciplinary pathway for the management of AR (Figure 3). MASK-rhinitis can be used by:

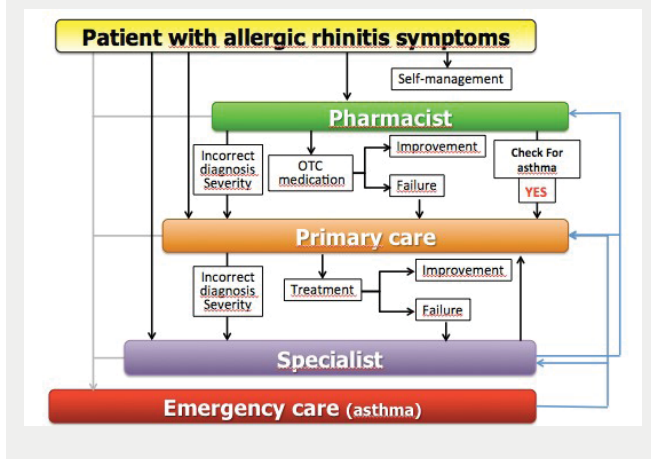
- I Patients, to screen for allergic diseases (in a later stage biomarkers will help to confirm the allergic origin of the symptoms).
- I Pharmacists, to guide them in the prescription of OTC medications and direct the uncontrolled patients to physicians.
- I The primary care physician, to prescribe appropriate treatment and to follow-up with the patient according to the

physician's instructions (CDSS) and assessment of control.

- I The specialist and outpatient clinics in allergology, if there is failure to gain control by the primary physician.

These tools are customized to be applicable globally.

FIGURE 3: CARE PATHWAY FOR ALLERGIC RHINITIS (FROM BOUSQUET ET AL (3))



4- Application of MASK rhinitis

4-1- Early detection of symptomatic patients

One of the major problems of patients suffering from pollen allergy is the identification of the onset of the pollen season at home as well as alertness when pollen peaks are to be expected. Another problem is when travelling to regions where the seasons of pollens eliciting symptoms may differ compared to home. Since patients will be geolocalized, they will be informed about the level of the pollen season and they will also be able to determine the season when travelling by using MASK-rhinitis.

4-2- Stratification of patients with severe allergic diseases

Patient stratification is needed to identify uncontrolled patients, those for whom specific immunotherapy or other interventions are appropriate. Although all studies are not consistent, in many diseases, ICT tools, ICPs, e-health and CDSS are likely to define the phenotypes of allergic patients. The main challenge for allergic diseases in the 21st century is to understand their complexity. The vast majority of AR patients can be treated using a simple algorithm. However, a substantial number of these patients are uncontrolled despite treatment (13) and require a personalized (tailored) approach.

4-3- Clinical trials

In specific immunotherapy RCTs, it is recommended to monitor pollen counts in order to determine the onset of the season and to correlate counts with symptoms. As discussed earlier, pollen counts alone may misrepresent exposure, especially if performed at a locality that is remote to that of a particular patient. As a result of such potential confounders, unconvincing data have been produced and a placebo-based method was found to be more effective (14). Moreover, there is a need to define the peak pollen season. MASK-

rhinitis is suitable for this approach (15).

BIOGRAPHIES

Rodolphe Bourret is a hospital director. He is a trained engineer and has a doctor's degree in physics. He has held various responsibilities in systems information, finance and management within teaching hospitals, local authorities and national committees.

He is currently Deputy Director General of the Montpellier teaching hospital. He is also Director of the hospital's Research and Innovation Unit and a member of the National Commission on Teaching, Research and Innovation.

Jean Bousquet Professor Bousquet has a public health interest in particular as past-Chairman of the WHO GARD. A main activity of GARD was to help include chronic respiratory diseases in the UN Resolution A/RES/64/265. He is leading the Région Languedoc-Roussillon programme on chronic disease for an active and healthy ageing (MACVIA-LR).

Jean Bousquet has edited and authored over 775 peer-reviewed papers posted on Medline. He was the editor of *Allergy*, the second ranking journal in the field, 2003-2009. His H factor is 100.

Jacques Mercier has obtained both his MD and PhD degrees from the University of Montpellier 1. After a post-doctoral position at the University of Berkeley (California), he has got the position of professor of physiology at the faculty of medicine (University of Montpellier) and chief of department of clinical physiology (Montpellier hospital) in 1998. His fields of expertise are (1) pathophysiology : myopathies and involvement of skeletal muscle in insulin resistance, (2) exercise physiology: metabolism and cell physiology (mitochondrial respiration and lactate exchanges). He has published more than 200 papers in internationally renowned scientific journals. Jacques Mercier is the head of the Department of Clinical Physiology (Montpellier hospital), the director the laboratory « Physiology and Experimental Medicine of Heart and Muscles » INSERM U1046/CNRS UMR 9214 and the Vice President Research of the University of Montpellier.

Thierry Camuzat, A Paris Business School graduate, Thierry CAMUZAT began his career as a consultant in management, organization and public policy evaluation for governments and local authorities.

He joined the city of Montpellier, as a director of the management control system.

He is now deputy managing director of the Region LANGUEDOC-ROUSSILLON, in charge of the regional budget, information and control systems, and the involvements of the Region in the fields of sport and public health.

He takes part in the coordination of the "MACVIA-LR" project in the name of the Region.

Anna Bedbrook B.Sc. has a joint honours degree (Pure Mathematics/French language) from UMIST, Manchester, UK.

She started working for ARIA (Allergic Rhinitis and its Impact on Asthma) in 2000.

She became the Executive Director of ARIA in 2014 and the project manager of MACVIA-LR (Fighting Chronic Diseases for Active and Healthy Ageing) in 2014.

She is currently the project manager of MASK (MACVIA-ARIA Sentinel Network) and is also involved in two EU projects, ASSEHS and SUNFRAIL.

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Virtual health: the next frontier for care 2015 Volume 51 number 3

Résumés en Français

Le Forum Venture+ et HX360 fournissent une vision de l'industrie de l'innovation des technologies de santé, des start-up et de l'activité d'investissement ; Faire progresser le nouveau modèle de soins

Présenté par HIMSS, le programme du Forum Venture+ et le concours de présentations donne une vue à 360 degrés sur l'investissement de la technologie de la santé et de meilleures entreprises innovantes d'aujourd'hui. Il met en scène des présentations passionnantes de 3 minutes des pays émergents et en phase de croissance, des panels d'investisseurs et une réception de réseautage. Parmi les récents gagnants du forum Venture+ Forum on trouve TowerView Health, Prima-Temp, ActualMeds et M3 Clinician.

Comme un catalyseur de l'industrie pour l'innovation informatique de la santé et des ressources de renforcement des entreprises et de solutions technologiques émergentes, HIMSS a co-développé avec AVIA, une nouvelle initiative qui traite de la façon dont les technologies émergentes, les systèmes de santé des changements de modèle d'affaires et de l'investissement transformeront la prestation des soins. HX360 engage les dirigeants des leaders des soins de santé, les équipes d'innovation, les investisseurs et les entrepreneurs autour de la vision de la transformation de la prestation des soins de santé en tirant parti de la technologie, du processus et de la structure.

Faciliter la gestion de santé virtuelle grâce à l'intégration de dispositifs médicaux

Les données issues des dispositifs médicaux connectés (DMC) sont une source riche et objective d'informations pour renforcer la gestion des soins au patient et la prise de décisions cliniques. Une raison principale est la mesure des caractéristiques des patients faite au moyen de DMC qui ne sont généralement pas soumis à des erreurs liées à une mauvaise interprétation, à un enregistrement incorrect et à un enregistrement de l'heure incorrect. De plus, les données des DMC peuvent être collectées régulièrement, assurant un enregistrement des données robuste et dense sur un patient donné. Comme les mesures représentent une source objective d'information qui facilitent la prise de décisions cliniques, la capacité de gérer et de surveiller les patients à distance est grandement facilitée par l'accès aux données.

Dans mon dernier livre, *Connected Medical Devices: Integrating Patient Care Data in Healthcare Systems*, j'aborde le sujet de l'intégration de dispositifs médicaux (IDM) en ce qui concerne la mise en œuvre de DMC dans les établissements de soins comme un guide pour aider les hôpitaux dans cette entreprise. La discussion suivante sur la IDM sont les paragraphes d'ouverture

de ce texte, suivis d'une discussion des architectures IDM.

Les hôpitaux devront envoyer une infirmière intégrée au domicile à chaque décharge

Les hôpitaux doivent s'adapter à l'environnement en mutation rapide du risque en modifiant le comportement de santé de leur populations. Il y a qu'une seule façon de le faire efficacement et à l'échelle ; envoyer une infirmière à la maison avec tous les patients au moment du retour au domicile. Cette infirmière peut assurer l'adhésion aux médicaments et lentement, au fil du temps, transformer un comportement personnel à la preuve fondée sur des niveaux... fondamentalement en respectent leurs ordonnances, en modifiant les habitudes alimentaires, en augmentant l'activité physique, en amenant les gens à arrêter de fumer, en leur apprenant à faire face, en améliorant leur sommeil et en réduisant leur stress.

Mais; cette approche nécessitera une infirmière qui vit « essentiellement » avec le patient pour des périodes prolongées, car les comportements de mauvaise santé s'instaurent rapidement, mais mettent longtemps à changer ou à terminer.

L'évolution rapide en intelligence artificielle et dans la compréhension du langage naturel va de pair avec l'informatique basée sur le cloud et intégrée à une variété de sources de données a conduit à un nouveau marché, composé de technologies cognitives qui peuvent émuler même l'infirmière la plus créative, compétente et efficace.

Appelé l'Assistant virtuel de santé, vos patients peuvent littéralement parler à ces agents à l'aide d'un langage conversationnel normal. La possibilité d'envoyer une infirmière à domicile pour chaque patient afin de maintenir le respect des ordonnances et d'éviter les réhospitalisations est arrivée.

La technologie est disponible. Qui récoltera d'abord les fruits de ces avancées ?

Faire des recherches en ligne sur les information de santé, par ordre alphabétique, personnelles et plus faciles

Le Dr. Howard Koh, ancien sous-secrétaire du Health and Human Services (HHS) a expliqué, « Tandis que [l'instruction en matière de santé] peut ne pas nécessairement faire la une, elle est absolument au cœur de tout ce que nous faisons comme soins de santé... professionnels. » Pourtant, fournir des informations de santé qui sont recherchées, sur le moyen accessible qui est Internet, signifie non seulement réduire le jargon, mais en réduire aussi le volume. La personnalisation est une réponse que Medivizor, une start-up en vedette dans Forbes, a mis au point pour répondre à ce besoin. Des hôpitaux et des fournisseurs ont fait un partenariat avec Medivizor pour améliorer l'instruction des patients en matière de santé, pour améliorer l'engagement et la

prise de décision collaborative.

Pas de retour en arrière - perspectives et les défis de la e-santé

L'E-santé est un terme qui fait référence aux outils et services utilisant des technologies d'informations et de communication (TIC) qui peuvent améliorer les soins de santé à bien des égards, tels que la prévention, le diagnostic, le traitement, le suivi et la gestion. Au petit « e » devant e-santé (initialement abréviation pour « santé électronique ») ont été ajoutées plusieurs significations : « e » se réfère également à l'efficacité, la responsabilisation des patients, les soins de santé fondées sur des preuves, une communication activée transfrontalière, et égalité d'accès aux services, par exemple. En outre, e-santé comprend l'attitude et l'attachement au réseautage et à une façon de penser globale. Le but de l'article est de décrire les défis, les perspectives et les multiples facettes de la e-santé, l'évolution des rôles du personnel soignant et des patients et de favoriser la discussion.

Si ces murs pouvaient parler : utiliser les données depuis la maison pour réduire les readmissions inutiles

Dans le contexte qui suit la loi sur la protection des malades et les soins abordables, la gestion de la prise en charge globale sont devenues une composante essentielle de l'objectif mondial de réduire les réadmissions à l'hôpital et les coûts associés. En utilisant les technologies de surveillance de la santé, les hôpitaux peuvent transformer les soins traditionnels de l'hôpital à la maison, ainsi qu'améliorer de manière significative les résultats des soins de longue durée à la maison. Pour atteindre le triple objectif de l'Institut d'amélioration des soins de santé, nous avons besoin d'une volonté généralisée et l'investissement dans la technologie des soins à domicile, qui relie les cliniciens, les fournisseurs et les payeurs, aux patients avec rapidité et précision. Une technologie qui génère des données de soins de santé en temps réel à partir de la maison est une clé essentielle pour progresser dans cette entreprise.

Saisir l'horizon de la santé: vers une plate-forme virtuelle, interopérable de santé

L'émergence de la santé numérique, des wearables, des applications, la télésanté et la prolifération des services de santé en ligne sont tous des indicateurs qui nous portent à croire que la santé fait l'objet d'une innovation rapide. L'innovation en santé a toutefois été traditionnellement lente, le coût élevé et le chemin de commercialisation n'était pas un chemin pouvant garantir l'adoption en dehors du milieu où il a été mis au point, qu'il s'agisse d'un hôpital, d'une université, d'une clinique ou d'un laboratoire.

La chose la plus significative, dans cette nouvelle explosion d'innovations en santé, est le volume considérable. La révolution des start-up, la santé mobile, la santé personnalisée et la mondialisation du savoir signifie que les consommateurs réclament des innovations et poussent les innovations en matière de santé par le biais de la commercialisation avec de nouveaux modes de financement tels que le crowdsourcing et les achats par revendeur direct.

Notre équipe australienne a lancé un projet pour utiliser l'apprentissage automatique, l'exploration de données et les techniques de classification pour rassembler et analyser cette expansion des innovations de santé partout dans le monde.

Après deux années d'agrégation des données et d'analyse de la qualité, nous présentons nos conclusions qui sont appliquées à plus de 200 000 innovations réalisées par plus de 25 000 organisations. Nos conclusions ont révélé la dynamique et la base pour un marché pour les innovations en matière de santé qui pourraient aider les innovateurs, les praticiens de la santé, les consommateurs, les investisseurs et les autres intervenants de santé à rechercher, évaluer et promouvoir ces innovations.

Collaboration du médecin - Maintenant plus que jamais nécessaire

Poussé par le climat changeant du remboursement qui passe du système basé sur le volume à celui basé sur la valeur, les systèmes hospitaliers doivent promouvoir la technologie et la formation afin d'assurer la coordination de la communication entre tous les professionnels de la santé impliqués dans un patient donné et la disponibilité immédiate, chaque point de service dans le système, de tous les résultats des tests et des plans de soins.

Depuis la promulgation de la loi sur la protection des patients et des soins abordables (PPACA), il y a eu d'intenses pressions sur les hôpitaux et sur les systèmes de santé pour réduire les coûts. Beaucoup d'hôpitaux réagissent en fusionnant et en achetant les pratiques des médecins, tandis que certains commencent à offrir leurs propres plans de santé pour la première fois et la mise en place des organismes de soins responsables qui permettraient la coordination des soins de santé de haute qualité pour de grands groupes de patients.

Avec de nouvelles fusions d'hôpitaux annoncées toutes les semaines et avec l'ajout quotidien de systèmes d'hôpital, la nécessité de collaborer à travers des initiatives de santé virtuelles gagne en force. L'ajout de la télémédecine sécurisée peu coûteuse à la disponibilité d'un dossier patient intelligent basé sur les meilleures lignes directrices de pratique permettra une plus grande collaboration au sein du système hospitalier. Ce type de technologie augmentera les revenus, réduira les coûts, améliorera les résultats et augmentera la satisfaction du patient.

MASK-rhinite un outil unique pour des soins intégrés dans la rhinite allergique

La rhinite allergique est une des maladies les plus fréquentes dans le monde. MASK-rhinite est un outil TIC simple permettant la mise en place de parcours de soin pour la rhinite allergique pour les patients et les soignants. MASK utilise le même langage et un système de décision clinique. L'ensemble est fondé sur le contrôle de la rhinite en utilisant une échelle visuelle analogique avec un téléphone mobile (patient) ou une tablette (médecin, pharmacien.....). Le même outil, MASK-rhinite, permet: 1- au patient d'adapter son traitement au contrôle de la rhinite, 2- au pharmacien d'optimiser et suivre la prescription et de savoir quand adresser le patient au médecin, 3- au médecin généraliste de proposer un traitement adapté et de suivre l'efficacité du traitement selon son schéma thérapeutique. En cas de mauvais contrôle d'adresser le patient au spécialiste et 4- au spécialiste ou au centre d'allergologie de vérifier le diagnostic et d'adapter le traitement. MASK-rhinite peut être utilisé à tous les âges de la vie, permet de stratifier les patients sévères mal contrôlés et de réaliser des essais cliniques.

Virtual health: the next frontier for care 2015 Volume 51 number 3

Resumen en Español

HIMSS Venture + Forum y HX360 ofrecen al sector una visión de la innovación tecnológica de la salud, el inicio y las actividades de inversión; Promoviendo el nuevo modelo de atención

Presentado por HIMSS, el programa Venture+ Forum y el lanzamiento del concurso proporcionan una vista de 360 grados sobre la inversión de tecnologías en la salud y las principales empresas innovadoras de la actualidad. Ofrece interesantes presentaciones de lanzamiento de 3 minutos por parte de empresas emergentes y en etapa de crecimiento, paneles de inversores y una recepción para establecer contactos. Entre los recientes ganadores del Venture+ Forum se incluyen TowerView Health, Prima-Temp, ActualMeds y M3 Clinician.

Como catalizador de la industria para la innovación en salud IT y de los recursos de fomento empresarial para el crecimiento de las empresas y soluciones de tecnología emergente, HIMSS ha desarrollado en colaboración con AVIA, una nueva iniciativa que aborda cómo las tecnologías emergentes, las inversiones y los cambios de modelo de negocio de los sistemas de salud va a transformar la prestación de la atención. HX360 involucra a líderes de salud de alto nivel, los equipos de innovación, inversores y empresarios en torno a la visión de transformar la atención sanitaria mediante el aprovechamiento de la tecnología, los procesos y la estructura.

Facilitar la gestión virtual en salud usando integración de dispositivos médicos

Los datos de los dispositivos médicos conectados (DMC) proporcionan una fuente objetiva y rica de información para aumentar la gestión de la atención al paciente y la toma de decisiones clínicas. Una razón principal es la medida de las características de los pacientes realizadas a través de los DMC que no son típicamente sujetas a errores asociados con la mala interpretación, la grabación incorrecta y la inscripción incorrecta de la hora. Además, los datos de los DMC se pueden recoger periódicamente, lo que garantiza un registro de datos denso y robusto para un paciente dado. El acceso a los datos facilita mucho la capacidad de gestionar y controlar a los pacientes de forma remota ya que las medidas representan una fuente objetiva de información que facilita la toma de decisiones clínicas.

En mi reciente libro, *Connected Medical Devices: Integrating Patient Care Data in Healthcare Systems*, se discute el tema de la integración de dispositivos médicos (IDM) en relación con la implementación de los DMC en los establecimientos de salud como una guía para ayudar a los hospitales en esta tarea. La siguiente discusión acerca de los IDM son los párrafos iniciales de este texto,

seguido de una discusión de las arquitecturas de IDM.

Los hospitales enviarán una enfermera integrada a domicilio con cada alta

Los hospitales deben adaptarse al entorno cambiante de riesgo cambiando el comportamiento de la salud de su población. Sólo hay una manera de hacer esto de manera eficiente y en escala; enviar una enfermera a casa con cada paciente en el momento del alta. Esa enfermera puede garantizar el cumplimiento con los medicamentos y poco a poco, con el tiempo, transformar el comportamiento personal a niveles basados en la evidencia... básicamente tomando su medicación según lo prescrito, cambiando los hábitos alimenticios, aumentando el ejercicio, haciendo que la gente deje sus cigarrillos, enseñándoles a enfrentar, mejorando su sueño y reduciendo su estrés.

Pero, este enfoque requiere de una enfermera que, básicamente, "viva" con el paciente durante períodos prolongados de tiempo, ya que los malos comportamientos de salud regresan rápidamente pero son lentos para cambiar o terminarlos.

El rápido desarrollo de la inteligencia artificial y la comprensión del lenguaje natural van emparejados con la computación basada en la nube e integrado con una variedad de fuentes de datos y han conducido a un nuevo mercado integrado por las tecnologías cognitivas que pueden emular incluso la enfermera más creativa, eficiente y eficaz.

Denominado el Asistente Virtual en Salud, sus pacientes pueden hablar literalmente a estos agentes utilizando el lenguaje de conversación normal. La posibilidad de enviar una enfermera a casa con cada paciente para cumplir con los medicamentos y evitar las readmisiones ha llegado.

La tecnología está disponible. ¿Quién será el primero en dar un paso adelante para cosechar los frutos?

Hacer búsquedas de información de salud en línea con conocimiento, personales y fáciles

El Dr. Howard Koh, ex Subsecretario de Salud y Servicios Humanos (SSH) explicó: "Mientras que [la alfabetización en salud] puede no atraer necesariamente los titulares, está absolutamente en el centro de todo lo que hacemos como profesionales... en atención de la salud." Sin embargo, dar acceso a la información sobre salud que se buscó en Internet no sólo reduce la jerga, también reduce el volumen. La personalización es una respuesta que Medivizor, una start-up que aparece en Forbes, ha desarrollado para responder a esta necesidad. Hospitales y proveedores se asocian con Medivizor para mejorar los conocimientos en salud de los pacientes, mejorar la participación y la colaboración en la toma de decisiones.

No hay vuelta atrás - perspectivas y retos de la eSalud

La eSalud es un término que se refiere a las herramientas y servicios que utilizan las tecnologías de la información y la comunicación (TIC) que pueden mejorar la atención de la salud de muchas maneras, como la prevención, el diagnóstico, el tratamiento, el seguimiento y la gestión. A la pequeña 'e' en frente de la eSalud (originalmente abreviatura de "salud electrónica") se le han añadido varios significados: 'e' también se refiere a la eficiencia, el empoderamiento de los pacientes, la atención sanitaria basada en la evidencia, permitió la comunicación transfronterizas y la equidad del acceso a los servicios, por ejemplo. Además eSalud incluye la actitud y el compromiso de trabajo en red y una manera global de pensar. El objetivo del artículo es describir los desafíos, las perspectivas y las múltiples facetas de la eSalud, los cambios en las funciones del personal de atención de la salud y los pacientes y fomentar la discusión.

Si estas paredes pudieran hablar: La utilización de los datos de salud desde la casa para reducir las readmisiones innecesarias

En el panorama de la ley de atención asequible, la gestión de atención integral se ha convertido en un componente esencial en el objetivo universal para reducir las readmisiones hospitalarias y sus costos asociados. Mediante la utilización de tecnologías de monitoreo de salud a domicilio en tiempo real, los hospitales pueden transformar el cuidado de transición del hospital al hogar al tiempo que mejoran significativamente los resultados de atención domiciliar a largo plazo. Para lograr el triple objetivo del Institute for Healthcare Improvement, necesitamos de un compromiso generalizado y la inversión en salud en el hogar de Tecnologías de la información para conectar médicos, proveedores y pagadores a los pacientes con velocidad y precisión. Una tecnología que genere datos de asistencia sanitaria en tiempo real desde la casa es una clave esencial para progresar en este esfuerzo.

Captando el horizonte de la salud: hacia una plataforma virtual e interoperable de innovaciones de salud

La aparición de la salud digital, los portátiles, las aplicaciones, la telesalud y la proliferación de los servicios de salud en línea son todos indicios de que la salud está experimentando una innovación muy rápida. La innovación de la Salud, sin embargo ha sido tradicionalmente lenta, el alto costo y el camino de la comercialización no eran un camino garantizado para la adopción fuera del entorno en el que se desarrolló, ya sea en un hospital, universidad, clínica o laboratorio.

Lo más significativo de esta nueva explosión de innovaciones para la salud es el volumen considerable. La revolución de las nuevas empresas, la salud móvil, la salud personalizada y la globalización del conocimiento significa que los consumidores están exigiendo innovaciones y están halando las innovaciones de la salud a través de la comercialización con nuevos modos de financiación, tales como el crowdsourcing y las compras a proveedores directos.

Nuestro equipo australiano inició un proyecto para utilizar el aprendizaje automático, la exploración de datos y las técnicas de clasificación para reunir y analizar esta expansión de innovaciones de salud por todo el mundo. Después de dos años agregando datos y analizando la calidad presentamos nuestras

conclusiones que se aplican a más de 200.000 innovaciones de más de 25.000 organizaciones. Nuestros resultados han identificado la dinámica y las bases para un mercado para las innovaciones de salud que podrían ayudar a los innovadores, los profesionales de la salud, los consumidores, los inversores y otros participantes de la salud a investigar, evaluar y promover estas innovaciones.

Colaboración del Médico - ahora más necesaria que nunca

Impulsado por el clima cambiante del reembolso que pasa del sistema basado sobre el volumen a aquel basado sobre el valor, los sistemas hospitalarios deben empezar con la tecnología y la capacitación para asegurar que las comunicaciones entre todos los profesionales sanitarios implicados en un determinado paciente se coordinen y todos los resultados de las pruebas y los planes de atención estén disponibles de inmediato en todos los puntos de atención en el sistema.

Desde la promulgación de la Ley de protección del paciente y la Ley de Asistencia Asequible (PPACA), se ha producido una intensa presión sobre los hospitales y sistemas de salud para reducir los costos. Muchos hospitales están respondiendo mediante la fusión y la compra de las prácticas de los médicos, mientras que algunos están comenzando a ofrecer sus propios planes de salud por primera vez y creando organizaciones responsables de la atención que proporcionan asistencia sanitaria coordinada de alta calidad para grandes grupos de pacientes.

Con las nuevas fusiones de hospitales que se anuncian semanalmente y las nuevas prácticas que se añaden a los sistemas hospitalarios diariamente, la necesidad de colaborar a través de iniciativas de salud virtuales está ganando fuerza. La adición de la telemedicina segura de bajo costo a la disponibilidad de un formulario de registro del paciente inteligente basado en directrices sobre mejores prácticas permitirá una mayor colaboración entre el sistema hospitalario. Este tipo de tecnología aumentará los ingresos, reducirá los costos, mejorará los resultados y aumentará la satisfacción del paciente y el proveedor.

MASK-rinitis una herramienta única para los cuidados integrados en la rinitis alérgica

La rinitis alérgica (RA) es una de las enfermedades más comunes a nivel mundial. MASK-rinitis es una herramienta TIC simple que permite implementar vías de atención para la rinitis alérgica para los pacientes y los proveedores de atención de la salud. MASK utiliza un lenguaje común y un sistema de apoyo a la decisión clínica. El conjunto se basa en la evaluación del control de la rinitis alérgica por una escala analógica visual con un teléfono móvil o una tableta. MASK-rinitis permitirá (i) a los pacientes de adaptar su tratamiento al control de la rinitis, (ii) a los farmacéuticos, guiarlos en la prescripción de medicamentos y saber cuándo dirigir los pacientes a los médicos, (iii) al médico de atención primaria, prescribir un tratamiento adecuado y seguir su eficacia de acuerdo con su sistema terapéutico. En caso de un mal control de dirigir el paciente al especialista y (iv) al especialista y a las clínicas especializadas en alergología, de verificar el diagnóstico y adaptar el tratamiento. MASK-rinitis se puede utilizar en todas las etapas del ciclo de la vida, de estratificar a los pacientes con rinitis severa no controlada y llevar a cabo ensayos clínicos.

IHF events calendar

2015

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2016 IHF 40th World Hospital Congress

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For more information, contact sheila.anazonwu@ihf-fih.org

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For more information, contact sheila.anazonwu@ihf-fih.org

2015

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Korean Hospital Association

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Organized by: European Hospital and Healthcare Federation (HOPE), the European Association of Hospital Managers (EAHM) and the European Association of Hospital Physicians (AEMH)

For further details contact the: IHF Partnerships and Project, International Hospital Federation, 151 Route de Loëx, 1233 Bernex, Switzerland;
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