



Suomen Telelääketieteen ja eHealth seura
Finnish Society of Telemedicine and eHealth

eHealth2018

**The 23rd Finnish National Conference on
Telemedicine and eHealth**

The 23rd ISfTeH International Conference

“Health communities facing cyber transformation”

15.3. – 17.3.2018

Helsinki - Stockholm - Helsinki

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Outi Ahonen, Jarmo Reponen**



Foreword

The 23rd Finnish National Conference on telemedicine and eHealth

Arto Holopainen, President

Finnish Society of Telemedicine and eHealth

Finnish Society of Telemedicine and eHealth (FSTeH) has been promoting the use of information and communication technology in health care since 1995. Our most important activity is to arrange educational events and to participate to the national discussion. Our society also publishes the Finnish Journal of eHealth and eWelfare (FinJeHeW) together with the Finnish Social and Health Informatics Association (FinnSHIA). Since 2004, we have delivered the annual Finnish eHealth award from the significant accomplishments in the field of telemedicine and eHealth. The required activity can be for example a doctoral thesis in this area or some other important activity in the national or international level supporting the society's goals.

We are supporting continuous education and training of health professionals in the eHealth sector by coordinating special competence for healthcare information technology to physicians and dentists together with Finnish Medical Association and Finnish Dental Association. We are proud to say, that in the year 2017 we had 100th enrolment for the program. Our conference will contribute 10 hours of theoretical training for Finnish physicians' and dentists' special competence for healthcare information technology.

Our society supports the international visibility of Finnish eHealth expertise by scholarships and our representatives participate to healthcare information technology standardization with IHE (Integrating Health Care Enterprise) Finland and other international standardization organizations. Our society is a founding member of Nordic Telehealth Association (NTA) and ISfTeH. Our society's secretary Pirkko Kouri holds one of the ISfTeH's board member seats as ISfTeH's vice-president.

This year's conference covers themes from updating the knowledge about international and Nordic eHealth trends and solutions. Top quality international keynote lectures are accompanied by up-to-date scientific abstracts that show an overview of eHealth and mHealth development around the world. In order to help scientists strive for brevity and clarity in their communications, we offer this year a new compact style of presentation called "5 Minute Rapid Scientific" presentations.

As part of conference, eHealth2018 Game Jam (Hackathon) organized by Games for Health Finland brings together healthcare professionals and game makers to create new ideas and ways to use eHealth technology and promote eHealth with gamification. You will have the opportunity to visit and see how the development is carried out and affect to the results of Game Jam. I warmly advise you to take advantage of this opportunity. We will see the eHealth2018 Game Jam results during the conference's "Collaborating innovations" session.

On behalf of Finnish Society of Telemedicine and eHealth I would like to express my gratitude to all lecturers and scientific abstract presenters for their valuable contributions. Our sincere thanks belong also to all our exhibitors and demonstrators. Without your support, this conference could not be the networking event it is today.

I wish everybody a very successful conference!



Arto Holopainen

Organizers



BOARD OF DIRECTORS 2017



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Finnish Society of Telemedicine and eHealth Suomen telelääketieteen ja eHealth seura ry

Finnish Society of Telemedicine and eHealth is an important forerunner in the field of telemedicine and eHealth in Finland as well as internationally. The aims of the Finnish Society of Telemedicine and eHealth are to promote the health of the population through telecommunication and to disperse the expert knowledge within health care.

To reach the aims the Society will arrange seminars, lectures and presentations, courses and symposia, develop a functioning electronic communication system between the members, exert publishing activities, supports research within the discipline, formulate statements in issues dealing with telemedicine and have contact with other telemedicine organisations.

We have a close collaboration with other national and international organisations, health care service providers and users. The purpose of the society is to promote education and development in the field of telemedicine and eHealth. Finnish Society of Telemedicine and eHealth is member of international networks such as International Society for Telemedicine and eHealth, Nordic Telemedicine Association, IHE International and European Connected Health Alliance.

The board accepts the members based on application. Membership will be available for individuals or companies and organisations, as well as supporting membership. Foreign and overseas members do not pay an annual fee, if they submit a regular report of the progress of eHealth in their respective countries

Internet: www.telemedicine.fi

Facebook: www.facebook.com/ehealthfinland

Twitter: www.twitter.com/FSfTeHP

The main activity of the FSTeH is annually organized the Finnish National Conference on Telemedicine and eHealth. The conference rotates between different cities and telemedicine sites to give local organizers the opportunity to promote their achievements

- 2018 – Cruising Helsinki-Stockholm (International)
- 2017 – Turku
- 2016 – Cruising Helsinki-Stockholm (Nordic)
- 2015 – Espoo
- 2014 – Tallinn, Estonia (International)
- 2013 – Seinäjoki
- 2012 – Cruising Helsinki-Stockholm
- 2011 – Joensuu
- 2010 – Cruising Helsinki-Stockholm
- 2009 – Oulu
- 2008 – Cruising Helsinki-Stockholm
- 2007 – Kuopio
- 2006 – Helsinki, NCeHT (International)
- 2006 – Cruising Helsinki-Stockholm
- 2005 – Lappeenranta
- 2004 – Kemi
- 2003 – Cruising Helsinki-Stockholm
- 2002 – Seinäjoki
- 2001 – Rovaniemi
- 2000 – Turku
- 1999 – Kajaani
- 1998 – Pori
- 1997 – Oulu
- 1996 – Kuopio (International)
- 1995 – Turku





International Society for Telemedicine & eHealth

NGO in official relations with WHO



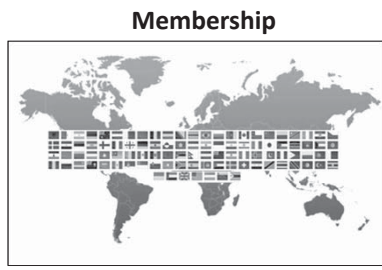
The International Federation of National Associations Representing Their Country's Telemedicine and eHealth Stakeholders

Partners



The Society was founded in Kobe (Japan) on May 30 and 31, 1997

Mission
The ISfTeH (www.isfteh.org) exists to facilitate the international dissemination of knowledge and experience in Telemedicine and eHealth and to provide access to recognized experts in the field worldwide.



99 countries and territories as per February 2018

Working Groups

- Students
- Telenursing
- Chronic Disease Management
- Collaborative Care Team in Open Source
- Education
- eHealth Economics
- Medical & Bio-Informatics
- Tele-Audiology
- Tele-cardiology
- Teledentistry
- Teledermatology
- Tele-Urology
- Women (WoW)



National Members

Associate Members

Institutional Members

Individual Members

Nurse Members

Students Members

Corporate Members

Through its various activities and members, the ISfTeH assists in the promotion and dissemination of research; helps to enhance healthcare services with new ICT tools and technologies; provides ideas to broaden educational programs and courses and widens international business network.

Publications

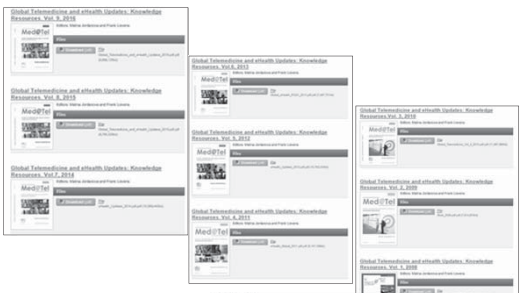
Journal of ISfTeH

A peer reviewed, open access, online journal covering all aspects of Health and health informatics journals.ukzn.ac.za/index.php/JISfTeH



Knowledge Resources

Download for free https://www.isfteh.org/media/category/knowledge_resources



Telemedicine History



Coming up!



The International Society for Telemedicine & eHealth (ISfTeH)



Mission Statement

The International Society for Telemedicine & eHealth (ISfTeH) was founded in 1997. The ISfTeH exists to facilitate the international dissemination of knowledge and experience in Telemedicine and eHealth, to provide access to recognised experts in the field worldwide, and to offer unprecedented networking opportunities to the international Telemedicine and eHealth community. The ISfTeH works as a non-governmental organization.

The International Society for Telemedicine & eHealth is THE international federation of national associations who represent their country's Telemedicine and eHealth stakeholders. The ISfTeH is also open to additional associations, institutions, companies and individuals with a keen interest in the subject of Telemedicine and eHealth, or with activities that are relevant to this field.

The ISfTeH fosters the sharing of knowledge and experiences across organizations and across borders and aims to promote, coordinate and support of telemedicine projects and activities throughout the world. Furthermore, ISfTeH cares for the widespread use of ICT tools and solutions in health and social care in order to:

- improve access to healthcare services
- improve quality of care
- improve prevention
- reduce medical errors
- integrate care pathways
- share and exchange information with citizens/patients
- reduce costs

Since 2008, the ISfTeH has also been awarded the status of "NGO in Official Relation with the World Health Organization", making it the international reference in Telemedicine and eHealth for health policy makers from around the world. Through its national member associations and through courses and conferences, the ISfTeH does participate in the establishment of eHealth training and implementation plans, and provides assistance and education where needed.

Join our network of member organizations from over 90 countries around the world (...and growing). The ISfTeH is your door to the global Telemedicine and eHealth community. Through its various activities and members, the ISfTeH can assist you in the promotion and dissemination of your research; help you to enhance your healthcare services with new ICT tools and technologies; provide ideas to broaden your educational programs and courses; and widen your international business network.

International Society for Telemedicine & eHealth (ISfTeH)

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relation with WHO

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Switzerland

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Finland

Executive Director
Prof. Yunkap Kwankam
Switzerland

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21stmd.com

<https://21stmd.vsee.me/w/clinic>

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www.amdtelemedicine.com

Arctic Dental

www.arcticdental.fi

Cambio Healthcare

www.cambio.se

Coala Life AB

www.coalalife.com

Ecca Nordic AB

www.eccanordic.com

Games for Health Finland

www.gamesforhealth.fi

Human Security Finland

<http://hsf.savonia.fi>

Klinik Healthcare Solutions Ltd.

www.klinikhealthcaresolutions.com

KuopioHealth

www.kuopiohealth.fi

MedHelp AB

www.medhelp.se

Muikkumedia Oy

www.muikkumedia.fi

Ninchat

www.ninchat.com

OuluHealth

www.ouluhealth.fi

Psykologpartners AB

www.psykologpartners.se

RISE Research Institutes of Sweden AB

www.ri.se

Råsunda Health Care Center

www.rasundavardcentral.se

Sharkmed Ltd.

www.sharkmed.fi

Siemens Healthcare Ltd.

www.healthcare.siemens.fi

Sigma AB

www.sigma.se

Swecare Foundation

www.swecare.se

Visiba Care AB

www.visibacare.com

Wolters Kluwer - Clinical Effectiveness

www.wolterskluwer.com



ARCTIC DENTAL



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SOLUTIONS

KUOPIO HEALTH



muikkumedia



RISE

psykologpartners



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E-HEALTH BY SIGMA



Special thanks to the Laurea University of Applied Sciences and Savonia University of Applied Sciences students as well as Riilahti Activity Centre for adults with learning disabilities for conference arrangements.

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Conference Program

THURSDAY March 15th 2018 (Finnish time)

Venue: Viking M/S Mariella, deck 8, conference

11.00 Registration opens
Ferry terminal at Katajanokka, Helsinki

12.00 Boarding

Session 1 - Citizens as partners: Disrupting healthcare
 (Auditorium AUB+AUS – Plenary)
 Chair President Arto Holopainen, Finnish Society of Telemedicine and eHealth

13.00 Finnish Society of Telemedicine and eHealth opening words
President Arto Holopainen
Finnish Society of Telemedicine and eHealth

13.10 International Society for Telemedicine and eHealth opening words
Vice-President Pirkko Kouri
International Society for Telemedicine and eHealth

13.20 National emphasis on citizen services
Minister of Family Affairs and Social Services Annika Saarikko
Ministry of Social Affairs and Health, Finland

13.35 Citizens as partners in European health
Head of Unit Tapani Piha
Cross-Border Healthcare & eHealth, European Commission

14.00 What does the citizen want from healthcare in the future?
Secretary General Tuija Brax
Finnish Heart Association

14.25 Delivery of Finnish national eHealth awards

14.40 Networking break, lunch exhibition and posters

Exhibition
 eHealth2018 Game Jam

Session 2A: Cyber era in leadership and education
 (Auditorium AUB)
 Chair Vice-Executive Director Frederic Lievens, International Society for Telemedicine and eHealth

15.10 How data turned to insight and changed the business?
Director of Culture Hanno Nevanlinna
Futurice

15.25 Is there any role for a real-life physician in the future?
Director of Emergency Services Santeri Seppälä
The South Savo Social and Health Care Authority, Finland

15.40 Multidisciplinary digital Health education
Principal Lecturer Pirkko Kouri
Savonia University of Applied Sciences, Finland

15.55 Mutual Learning and Exchange of Health Informatics Experiences from around the world
Professor Sabine Koch
Karolinska institute, Sweden

16.10 Interpretive reflection in robotic surgery – can digital technologies enhance its learning?
Senior Researcher Laura Seppänen
Finnish Institute of Occupational Health

16.25 Presentations from exhibition

17.00 Networking break, accommodation

17.30 Ship Leaves Helsinki

Exhibition
 eHealth2018 Game Jam
 Workshop: Testbed / Living Lab Open Forum
 Session 2B

THURSDAY March 15th 2018 (Finnish time)

Session 2B: National and mobile eHealth (5 min Rapid Scientific Presentations)

(Auditorium AUS)

Chair Prof. K. Ganapathy, Apollo Telemedicine Networking Foundation, India

Co-Chair Faculty Member Claudia Bartz, College of Nursing, University of Wisconsin

- 15.10 Telefitting in the National Network of Teleaudiology – chance and opportunity for constant care of CI patients in Kyrgyzstan**
Ass. Prof. Dr. Piotr Henryk Skarzyński Piotr Henryk^{1,2,3}, M.D., Ph.D., M.Sc.; Maciej Ludwikowski¹, M.Sc. MBA; Weronika Świerniak¹, M.Sc.; Prof. Henryk Skarzyński¹, M.D., Ph.D., dr. h.c. multi
¹World Hearing Center, Institute of Physiology and Pathology of Hearing, Warsaw/Kajetany, Poland; ²Heart Failure and Cardiac Rehabilitation Department, Medical University of Warsaw, Warsaw, Poland; ³Institute of Sensory Organs, Warsaw/Kajetany, Poland
- 15.17 Increasing Need for an eHealth Impact Framework for Africa**
MBChB, MMedSci^{1,2,3}, Maurice Mars, MBChB, MD¹, Richard Scott, PhD^{1,4}, Author/Tom Jones, BA, FCCA, CPFA²
¹University of KwaZulu-Natal; ²African Centre for eHealth Excellence; ³HISP-SA; ⁴NT Consulting – Global e-Health Inc.
- 15.24 Multidisciplinary Teleconsultation in Developing Countries**
Ferrari F.¹, Erba F.², Bartolo M.³
¹Department of Radiodiagnosics, University La Sapienza, Rome, Italy; ²Department of Clinical Sciences, University of Tor Vergata, Rome, Italy; ³Department of Telemedicine, Hospital San Giovanni-Addolorata, Rome, Italy.
- 15.31 Interprofessional Collaborative Urotelehealth Program in Rural Northeastern Ontario—Patients’ Perceptions**
Abara E., Reid C., Abara N., Lacroix M., Thomas C., Wu B., Denton R.
Rural Hospitals in Northeastern Ontario-Hornepayne, Iroquois Falls, Kirkland Lake, Sensenbrenner; Division of Clinical Sciences, Northern Ontario School of Medicine, Sudbury/Thunder Bay, Ontario
- 15.38 Deployment of National Kanta Services 2010–2017**
Jormanainen VJ, MD MSc
National Institute for Health and Welfare (THL), Health and Social Care Systems, Social and Health Systems Research
- 15.45 Virtual hospital 2.0 – modelled cost-benefit assessment: Towards potential economic efficiency with digitalization and customer-responsive services**
Saku Väätäinen¹, MSc, Erkki Soini¹, MSc, Sirpa Arvonen², MSc
¹ESIOR Oy, Kuopio, Finland; ²Virtuaalisairaala 2.0 -hanke, Helsinki University Hospital
- 15.52 Multidisciplinary Digital Intervention for Youth and Children in Kuopio Public Oral Health Care – the ODA Pilot Project**
Anni Riepponen DDS^{1,2,3}, Heidi Liukkonen, Dental Assistant¹, Tuula Miettinen, Dental Hygienist¹, Maija Rajamaa DDS¹, Katariina Savolainen, M.Sc. Dental Hygienist^{1,4}
¹City of Kuopio Public Health Center, ²Kuopio University Hospital Teaching Clinic, ³University of Eastern Finland Institute of Dentistry, ⁴University of Eastern Finland Faculty of Health Sciences
- 15.59 Self-care and digital value services as part of comprehensive school aged children and their families’ welfare**
Sanna Niinimäki¹, MSc, Maiju Tirri¹, Public Health Nurse, Arto Holopainen¹, MSc (Tech), Hanna-Mari Tammisen¹, PhD, RN, Katriina Kankkunen¹, MHS
¹City of Kuopio, Social and Health
- 16.06 Smart Digital Solutions for Future Ageing**
Anthony Maeder, PhD, Gary Morgan, MBA
Flinders Digital Health Research Centre, College of Nursing & Health Science, Flinders University, Adelaide, Australia
- 16.13 Effects of ubiquitous 360° patient counselling environment on cardiological patient’s health-related quality of life**
Karoliina Paalimäki-Paakki¹, MSc, PhD student, Anja Henner¹, PhD, Kirsi Koivunen¹, PhD, Maria Käiriäinen², Prof.
¹Oulu University of Applied Sciences; ²University of Oulu
- 16.20 Special Interest Group Tel@ Amazonia: telehealth intervention for security food and nutrition of mothers and babies in the deep rainforest**
Silva¹, Angélica Baptista MPH, PhSc; Monteiro², Lucia Maria Costa MD, PhD Garzón³, Martha Inés Camargo MD; Santos⁴, Waldeyde Oderilda Magalhães MBA; Rodrigues⁵ Pedro Máximo de MD; Filha⁶, Ianê Germano; Benevides⁷, Katherine Mary Marcelino; Corre⁸, Esther Mourão MD
¹Oswaldo Cruz Foundation, (FIOCRUZ) National Institute of Women’s, Fernandes Figueira Children’s and Adolescents’ Health, Telehealth Laboratory, Brazil; ²Oswaldo Cruz Foundation, National Institute of Women’s, Fernandes Figueira Children’s and Adolescents’ Health, Brazil; ³Health Ministry, Colombia; ⁴State University of Amazonas, Brazil; ⁵Nutrition and Children Dept., Health State Secretary of Amazonas, Brazil
- 16.27 Mobile application – new telemedicine tools?**
Ass. Prof. Dr. Piotr Henryk Skarzyński^{1,2,3}, M.D., Ph.D., M.Sc.; Justyna Kutuba¹, M.Sc.; Katarzyna Cywka¹, M.Sc.; Beata Dziendziel¹, M.Sc.; Weronika Świerniak¹, M.Sc.; Anna Sztabnicka¹, M.Sc. Prof. Henryk Skarzyński¹, M.D., Ph.D., dr. h.c. multi
¹World Hearing Center, Institute of Physiology and Pathology of Hearing, Warsaw/Kajetany, Poland; ²Heart Failure and Cardiac Rehabilitation Department, Medical University of Warsaw, Warsaw, Poland; ³Institute of Sensory Organs, Warsaw/Kajetany, Poland
- 16.34 Telehealth in India: Illustrations from Apollo Telehealth**
K. Ganapathy MD Ph.D, S.Premnand MBA, N. Lovakanth M.Sc & Vikram Thaploo MBA
Apollo Telehealth Services, India
- 16.41 Discussion**

17.00 Networking break, accommodation

17.30 Ship Leaves Helsinki

Exhibition
eHealth2018 Game Jam
Workshop: Testbed / Living Lab Open Forum
Session 2A

THURSDAY March 15th 2018 (Finnish time)					
Session 3A: Benchmarking nationwide eHealth communities, (Auditorium AUB) Chair: Prof. Yunkap Kwankam, Executive Director, International Society for Telemedicine and eHealth					
17.40	Presentations from exhibition		Session 3B	Exhibition	
18.20	Citizen experiences of eHealth services <i>Research Manager Hannele Hyppönen</i> <i>National Institute for Health and Welfare, Finland</i>				eHealth2018 Game Jam
18.35	Fundamental change in Health professionals' tools <i>Professor Jarmo Reponen</i> <i>University of Oulu, Finland</i>				
18.50	Nordic Countries: how eHealth revolutionized Health policies <i>Professor Arild Faxvaag</i> <i>University of Trondheim, Norway</i>				
19.10	Data and intelligence from eHRs for health care improvement and innovation: Where do countries stand? <i>Senior Economist and Policy Analyst Jillian Oderkirk</i> <i>OECD Directorate for Employment, Labour and Social Affairs</i>				
Session 3B: My solutions: eHealth around the world (5 min Rapid Scientific Presentations), (Auditorium AUS) Chair: Ass. Prof. Piotr Skarzynski, University of Warsaw Co-chair Professor Anil Kumar Jha, Department of Dermatology and Venereology, Nepal medical college teaching hospital					
17.40	MHealth Adoption Issues: Similarities and Differences between Patient and Health Personnel in the Developing world. A Systematic Review <i>Addotey-Delove Michael Nii-Addotey^{1,2}, Richard E. Scott^{1,3}, Maurice Mars¹</i> <i>¹TeleHealth Department, University of KwaZulu-Natal, Durban, South Africa; ²Pentecost University College, Accra, Ghana; ³NT Consulting – Global e-Health Inc., Calgary, Alberta, Canada; University of Calgary, Calgary, Alberta, Canada</i>		Session 3A	Exhibition	
17.47	HABBITualising mHealth <i>Marlien Varnfield¹, PhD, Christian Redd¹, PhD, Kevin Saric¹, John O'Dwyer¹, Mohan Karunanithi¹, PhD</i> <i>¹Australian eHealth Research Centre (AEHRC), Commonwealth Scientific and Industrial Research Organisation</i>				
17.54	Experiences of chat-doctor services in private sector <i>Timo Carpén¹, MD, Päivi Metsäniemi¹, MD, Sari Riihijärvi¹, MD, PhD</i> <i>¹Suomen Terveystalo Oy, Helsinki, Finland</i>				
18.01	Leveraging Teletriage in an Urban Emergency Department to Improve Flow and Patient Experience <i>Joshi¹, Aditi U. MD, MSc, Randolph¹, Frederick MD, MBA; Hollander¹, Judd E. MD; Sabonjian¹, Megan MBA; Sites¹, Frank D. MHA, BSN, RN; Ambrosini¹, Alexander.</i> <i>¹Department of Emergency Medicine, Thomas Jefferson University Hospital</i>				
18.08	Using Technologies to Improve the Flow of Communication in Emergency Care <i>Jari Haverinen (MSc)¹, Maarit Kangas (PhD)^{1,2}, Lasse Raatiniemi (MD, PhD)³, Iita Daavittila (MD, PhD)⁴, Jarmo Reponen (MD, PhD)^{1,2}, Minna Pikkarainen (PhD)^{1,5,6}</i> <i>¹Research Unit of Medical Imaging, Physics and Technology (MIPT), University of Oulu; ²Medical Research Center Oulu, Oulu University Hospital and University of Oulu, Finland; ³Centre for pre-hospital emergency care, Oulu University hospital, Oulu, Finland, ⁴Oulu University Hospital, ⁵VTT, Technical Research Centre of Finland; ⁶Martti Ahtisaari Institute, Oulu Business School, University of Oulu</i>				
19.15	Machine Learning Classification Can Identify Patients at Risk of Cardiovascular Event on Action to Control Cardiovascular Risk in Diabetes (ACCORD) Trial <i>Kelvin Tsoi, PhD^{1,2}</i> <i>¹Stanley Ho Big Data Decision Analytics Research Centre; ²Jockey Club School of Public Health and Primary Care, The Chinese University of Hong Kong</i>				
18.22	Lessons from the American healthcare data breach records <i>Niina Keränen^{1,2}, MD, MSc, Jari Haverinen¹, MSc, Jarmo Reponen^{1,2}, MD, PhD</i> <i>¹Research Unit of Medical Imaging, Physics and Technology, University of Oulu; ²Medical Research Center, Oulu University Hospital, University of Oulu</i>				
18.29	Agile methods in developing a modern search tool for the physicians' clinical resource database <i>Jukkapekka Jousimaa¹, MD, PhD, Juha Kautto¹, M.Sc. (Tech), Juuso Landgren¹, MBA</i> <i>¹Duodecim Medical Publications Ltd.</i>				
18.36	The availability and EMR integration of decision support systems in Finnish healthcare 2007-2017 <i>Niina Keränen^{1,2}, MD, MSc, Maarit Kangas^{1,2}, PhD, Jari Haverinen¹, MSc, Päivi Hämäläinen¹, MD, PhD and Jarmo Reponen^{1,2}, MD, PhD</i> <i>¹Research Unit of Medical Imaging, Physics and Technology (MIPT), University of Oulu; ²Medical Research Center Oulu, Oulu University Hospital and University of Oulu; ³National Institute for Health and Welfare</i>				
18.43	Courses on telemedicine technologies of continuous medical education at RUDN-University <i>V.L. Stolyar¹, PhD, E.A. Lukianova¹, PhD</i> <i>¹RUDN-University, Department of Medical Informatics and Telemedicine</i>				
18.50	Living Lab platforms in the City of Kuopio and Kuopio University Hospital <i>Metsävainio, Kirsimarja¹, MD; Kaunisto, Merita¹, Midwife, MSc; Kekäläinen, Heli², RN, Master of Social and Health Care; Kämäräinen, Pauliina², RN, BSc student; Holopainen, Arto², MSc (Tech)</i> <i>¹Kuopio University Hospital, Living Lab project; ²City of Kuopio, Living Lab project</i>				
18.57	Results from University Hospitals as Innovation Platforms -project – YSI Co-creation model and Oulu University Hospital Innovation Process <i>Pauliina Hyrkäs, BSc</i> <i>Oulu University Hospital / Northern Ostrobothnia Hospital District</i>				
19.04	Isaacus pre-production project: child protection process and placement decision <i>Taru Hallinen¹, MSc, Erkki Soini¹, MSc, Arja Kekoni², MSc, Johanna Kotimaa², MSc, Minna Nykänen³, MSc, Jyrki Tirkkonen³, MSc, Markku Tervahauta², MD, PhD</i> <i>¹ESiOR Oy, Kuopio, Finland; ²City of Kuopio, Kuopio, Finland; ³Istekki Oy, Kuopio, Finland</i>				
19.11	Indian Telemedicine Program from Concept to completion - Towards National Adaption <i>Prof.Satyamurthy. L.S ; B.E.Electrical and Mechanical Engg, PG Electronics</i> <i>Suquino, Indian Space Research organization (ISRO), Telemedicine Society of India (TSI)</i>				
19.18	Reaching the unreached : An innovative eHealth initiative in Nepal <i>Anil Kumar Jha, MD, PhD</i> <i>Department of Dermatology and Venereology, Nepal medical college teaching hospital</i>				
21.00	A la carte dinner, Viking Buffet, deck 7				

FRIDAY March 16th 2018 (Swedish time)

10.00 Ship arrives to Stadsgården Terminal, Stockholm, Sweden

Session 4 - Site visits at Stockholm

Chair: Raino Saarela, Finnish Society of Telemedicine and eHealth

10.00 Bus transportation to site visits at Stockholm

Ferry terminal, Note! Site visits have limited seats available.

Site Visit Group 1: Swedish eHealth Frontrunners

- Swecare - Developing global partnerships in health for Swedish companies
- MedHelp - Nordic Careoperator with smart solutions in eHealth
- Visiba Care - eHealth platform that allows healthcare providers to open their own digital practice anywhere anytime
- Coala Life - Solutions enabling daily monitoring and analysis of your heart
- Psykoloppartners - applied psychology and contextual behavioral sciences in the Nordic countries
- Nordic Health Living Lab

Site Visit Group 2: Future Care of Patients with Chronical Diseases

- RISE - Novel eHealth-solutions for the benefit of individuals and caregivers
- RISE - Hands-on demonstrations
- Cambio Healthcare – innovative e-healthcare solutions
- Sigma - solutions for the healthcare of tomorrow

Site Visit Group 3: Primary Care Center & eHealth

- Råsunda Primary Care Center – eHealth in practise
- Siemens Healthcare - Digital EcoSystem and eHealth vision 2025

13.00 Networking break, lunch and exhibition

Session 5A: Beating Cancer with the help of cyber community

(Auditorium AUB)

Chair: Chief Physician Päivi Metsäniemi, Terveystalo, Finland

14.00 Being a patient in a cyber community

Executive Director Minna Anttonen

Association of Cancer Patients in Finland

14.20 New era for cancer support services with eHealth?

Director of Strategy and Foresight Satu Lipponen

Cancer Society of Finland

14.40 Collaboration and crowdsourcing - how oncologists work today?

Associated Annelie Liljegen

Karolinska Institutet, Sweden

15.00 Probabilistic Patient Modeling for Therapeutic Decision Support in Oncology

PhD Researcher Jan Gaebel

University Leipzig, Germany

15.20 Discussion: it's not the tools, it's the process. How to succeed in implementing digital service

Chief Physician, Medical Development Päivi Metsäniemi

Terveystalo Oy, Finland

Exhibition
eHealth2018 Game Jam
ISTeH Board Meeting
Session 5B

16.00 Networking break, coffee and refreshments

Session 5B: Tackling acute crisis in local and distant environments

(Auditorium AUS)

Chair: Dr. Claudia Bartz, International Society for Telemedicine and eHealth, Telenursing

14.00 How to tackle acute health problems in space medicine

Head of the DLR-Fligh Medicine Clinic Claudia Stern

DLR-Institute of Aerospace Medicine, Germany

14.20 New innovations in arranging emergency care and first visit

Project Coordinator Marja Ylilehto

Northern Ostrobothnia Hospital District, Finland

14.40 Maritime emergency response services on Gulf of Finland

Lieutenant Janne Sarkala

Finnish Coast Guard, Gulf of Finland district Maritime Rescue Sub Center Helsinki

15.00 Arctic conditions and acute health problems

Chief Medical Officer Tom Silfvast

Helsinki University Hospital, Finland

15.20 Security of supply in the healthcare sector

Special Advisor Riku Juhola

National Emergency Supply Agency, Finland

15.40 Technological Innovations in Latvian Emergency Medical Service

Chief Specialist Dita Heibergera

State Emergency Medical Service, Latvia

Exhibition
eHealth2018 Game Jam
ISTeH Board Meeting
Session 5B

16.00 Networking break, exhibition and posters

16.30 Ship leaves Stockholm

FRIDAY March 16th 2018 (Swedish time)

Session 6 - Collaborating innovations

(Auditorium AUB+AUS – Plenary)

Chair: President Andy Fischer, International Society for Telemedicine and eHealth

16.30 Presentations from exhibition

17.00 European Living Labs

Director Tuija Hirvikoski

Laurea University of Applied Sciences, Finland

17.20 eHealth2018 Game Jam results

18.00 International Society for Telemedicine and eHealth

President Andy Fischer

International Society for Telemedicine and eHealth

18.10 Summary and closing words

President Arto Holopainen

Finnish Society of Telemedicine and eHealth

18.30 General Assembly of the Finnish Society of Telemedicine and eHealth

19.30 Buffet dinner

Viking Buffet, deck 7

SATURDAY March 17th 2018 (Finnish time)

10.00 Ship arrives to Kajanokka Terminal, Helsinki, Finland

Session 1: Citizens as partners: Disrupting healthcare

*Chair: President Arto Holopainen,
Finnish Society of Telemedicine and eHealth*

Thursday March 15th, 2018

13:00 – 14:40

- 1-1** **Finnish Society of Telemedicine and eHealth opening words**
Arto Holopainen, President
Finnish Society of Telemedicine and eHealth
- 1-2** **International Society for Telemedicine and eHealth opening words**
Pirkko Kouri, Vice-President
International Society for Telemedicine and eHealth
- 1-3** **National emphasis on citizen services**
Annika Saarikko, Minister of Family Affairs and Social Services
Ministry of Social Affairs and Health, Finland
- 1-4** **Citizens as partners in European health**
Tapani Piha, Head of Unit
Cross-Border Healthcare & eHealth, European Commission
- 1-5** **What does the citizen want from healthcare in the future?**
Tuija Brax, Secretary General
Finnish Heart Association
- 1-6** **Delivery of Finnish National eHealth Award**

Finnish Society of Telemedicine and eHealth opening words

Arto Holopainen, President

Finnish Society of Telemedicine and eHealth

Biography Arto Holopainen



Mr. Arto Holopainen, MSc (Tech.) is President for the Finnish Society for Telemedicine and eHealth. He is working as Senior Digital Advisor (Social and Health) at City of Kuopio, a premier city in Finland focusing on well-being, health and security competence. In this role he works as technical leadership to the digitalization of health care services and change agent in digital health revolution. He is promoting the use of international standards as a Secretary at European committee for standardization (CEN) working group “Technology and Applications in Health Informatics” (TC251/WGII). His passion is the disruption and opportunity that digital revolution represents for people.

Dear invited guests, dear participants of the conference,

It is my great pleasure to warmly welcome all of you to our 23rd Finnish National Conference on Telemedicine and eHealth (#eHealth2018). This year is a special for us. We are honoured to host for the first time in Finland, International Society for Telemedicine and eHealth’s (ISfTeH) annual international conference, the 23rd ISfTeH International Conference, together with our national event.

The conference theme this year is “*Health communities facing cyber transformation*” including presentations from national eHealth implementations, services for developing countries, personal health data utilization, on-line health services, machine learning, mobile applications, eLearning and decision support tools.

Last year we celebrated the centenary of Finland’s independence and today, on the eve of the next 100 years, I’m proud to see Finland as one of the world’s eHealth forerunners with other Nordic countries. In Finland, the availability of electronic medical record systems is 100% both in public and private sectors. At the same time Finland is ongoing one of the biggest ever administrative and operational reform in health and social services that affects the services of every citizen in the country. Digitalisation has a major role in the reform and promotes the user-centric approach in the services. This cyber transformation brings eHealth more and more to every day life.

We are moving towards platform economy, where MyData is becoming more and more important as a basis for new personalised health solutions. New technologies are adapted to healthcare from other industries, e.g. blockchains from financial world. At the same time legal framework is evolving to cope with fast paced development, e.g. new EU General Data Protection Regulation (GDPR), Medical Device Regulation (MDR) and In-Vitro Diagnostic Regulation (IVDR) are being implemented.

Health communities, social and health services are transforming into co-creation platforms, Living Labs and Testbeds where the public sector, industry, academia and citizens work together for future health solutions. These globally connected health innovation ecosystems have brought us exciting possibilities to work together and share knowledge. During the conference there are workshops related to Living Labs, hack the humanity addressing patient safety solutions as well as eHealth2018 Game Jam for gamified health solutions.

This conference offers for all of us a unique meeting place to listen, discuss and innovate.

International Society for Telemedicine and eHealth opening words

Pirkko Kouri, Vice-President

International Society for Telemedicine and eHealth

Biography Pirkko Kouri



PhD, PHN, RN, Principal Lecturer in Health Care Technology. She is in charge of coordinating Master in Digital Health Programme at Savonia University of Applied Sciences, and she represents social and health care field in Savonia's multidisciplinary master programme team. She was during five years Savonia's representative and a member of national Master Programme team. Furthermore, she is the coordinator of China cooperation in Social and Health Care field. She has had many eHealth projects, from local- regional-national to international level. She has written over 70 articles both in scientific and professional journal. She has several memberships: the Vice President of Board of Directors in International Society of Telemedicine and eHealth (ISfTeH); Board member and secretary in Finnish Telemedicine and eHealth Association (FTeHS); Member of IMIA-Nursing Informatics education-working group; Chair of Regional Cancer Association.

Dear participants of the 23rd Finnish National Conference on Telemedicine and eHealth, which is organised in collaboration with the 23rd ISfTeH International Conference on Telemedicine and eHealth (ISfTeH)

On behalf of the International Society for Telemedicine & eHealth (ISfTeH) I have a great pleasure to cordially welcome into our joint conference. The purpose is to raise fruitful discussion while experiencing and comparing international eHealth and telehealth development around the world.

The starting point of ISfTeH was created in Norway 1993. A group of eager experts met to discuss the possibility of forming an international society around telemedicine. After two conferences, in 1995 and in 1997 the Society was finally created. I am proud to say that in the First Board of the International Society for Telemedicine (ISfT) had a Finnish member, Mr Jarmo Reponen!

Development of telemedicine widened and ISfT becomes ISfTeH in 2005, and the name was renewed into International Society for Telemedicine and eHealth (ISfTeH), at that time the term "eHealth" was recognized by all International Organisations such as WHO, ITU, EU, etc.

ISfTeH aims at promoting international health telematics – particularly telemedicine, eHealth and associated fields – including research, development, practical applications and initial and supplementary training for the benefit of the world's population.

Telemedicine and eHealth have a strong label of multidisciplinary. When versatile experts bring together their expertise to develop new solutions in the field of healthcare, definitely innovations and new ways of working will be produced.

The importance of people's own choices will increase. Globally thinking the Nordic countries have a special feature, strong patient-centeredness. Furthermore, environments that support health and freedom of choice are being built with the help of new markets and a new health culture. The tools for developing new health markets are, for example, identifying co-benefits, creating shared value, and promoting impact investment. New types of markets mean that health care field needs to build new partnerships and both educate and take health professionals into new environments.

Being a very first board member of nursing background and the first female vice-president, I hope that I can encourage also women to join ISfTeH work.

I wish everyone a pleasant and fruitful 'networking conference'!

National emphasis on citizen services

Annika Saarikko, Minister of Family Affairs and Social Services

Ministry of Social Affairs and Health, Finland

Biography Annikka Saarikko



Annika Saarikko, 34, was appointed Minister of Family Affairs and Social Services in the summer of 2017. She took responsibility for one of the biggest reforms in Finland in recent decades: the healthcare and social welfare reform. Mrs Saarikko became a Member of the Finnish Parliament in 2011, one year after becoming Vice Chair of the Centre Party, which post she held for three terms. During her terms in Parliament, Annika Saarikko has focussed on issues pertaining to equality as well as healthcare and social welfare.

In addition to the healthcare and social welfare reform, the focus areas of the Ministry of Social Affairs and Health this year include, in particular, services for children and families, services to older people, overall reform of social security as well as utilisation of digitalisation, health technology and genome data.

Citizens as partners in European health

Tapani Piha, Head of Unit

Cross-Border Healthcare & eHealth, European Commission

Biography Tapani Piha



Tapani Piha works as Head of Unit for Cross-Border Healthcare & eHealth in the European Commission. The Unit works on the Directive on patients' rights in cross-border health care, develops the strategy for digital health and care in the EU and data management and protection, builds cross-border exchange for e-prescriptions and patient data, and is setting up the European Reference Networks of clinical centres specialised on rare diseases. In the Commission since 2001, he has been responsible for policies on Health Technology Assessment (HTA), health strategy, health information, expert advice for health systems, health law, health research coordination, and managed human resources in the Directorate General. After studying medicine in the Turku University, he carried out epidemiological and intervention research on health behaviours and cardiovascular disease. Then he worked in the Finnish Ministry of Health and coordinated Finland's EU policy in health in 1995-2001. At the WHO Regional Office for Europe in 1989-94 he was responsible for the Action Plan for a Tobacco-free Europe.

Background

Digitalisation of healthcare in Europe is the top priority for the European Commission. The Digital Single Market Strategy calls for greater standardisation and interoperability of eHealth solutions, and seeks to unleash the potential of the healthcare sector as a driver for digital growth. In the mid-term review on the Digital Single Market Strategy in May 2017, the Commission pledged to adopt a Communication to address the measures in the area of digital health and care, in line with legislation on the protection of personal data, patient rights and electronic identification.

Communication on Digital Transformation of Health and Care

The forthcoming Communication on Digital Health and Care aims to support Member States in making greater use of digital tools in health under three pillars, with a special focus on empowering citizens to be actors in their own health.

a) Secure access to and sharing of electronic health records by citizens

These actions will take forward the current work to exchange e-prescriptions and patient summaries across borders. The ambition is to share larger parts of or the full electronic health records. The second main objective is to enable citizens to access securely their electronic health records.

b) Connecting health data to advance research, prevention and personalised medicine

The objective is to promote European digital tools to advance research, prevent disease and promote personalised medicine. The actions will be supported by EU-funded high performance computing and the European Open Science Cloud. Clear benefit could be seen in the area of rare and infectious diseases as well as use of real world data. The European Reference Networks (ERNs), which were launched in March and whose clinical operations started in November 2017, will play an important role in demonstrating the use of telemedicine in cross-border diagnosis and treatment of patients with rare diseases. By 2019, the current 24 ERNs will be fully operational.

c) Using digital tools to foster citizen empowerment and person-centred care

These actions aim to help both citizens and health systems benefit from innovative digital tools. Objectives include enabling health authorities to implement mHealth and telemedicine solutions as part of new care models and thus address the rising demand for healthcare. Another objective is to empower citizens by engaging them in health promotion, disease prevention and effective self-management of chronic diseases. Such empowerment should be part of a population health strategy and linked with prevention and care programmes.

Results of the Public Consultation

In mid-2017, the Commission launched an open public consultation on the three pillars outlined above. Almost 1,500 responses were received between July and October 2017. The findings showed that over 93% believe that "citizens should be able to manage their own health data". Furthermore, 83% of all respondents either agree or strongly agree that "sharing of health data could be beneficial to improve treatment, diagnosis and prevention of diseases across the EU". The overwhelming majority of all respondents (73.6%) identify improved possibilities for medical research as a reason for supporting cross-border transfer of medical data, which was higher even than for the purpose of their own treatment (67.8%). Risks of privacy breaches and cybersecurity topped the list of major concerns to cross-border transfer of medical data. There is strong support for EU action on privacy, security and interoperability of healthcare data, as well as for training of a skilled workforce with the necessary IT skills and competences to deliver improved patient-centred care.

What does the citizen want from healthcare in the future?

Tuija Brax, Secretary General

Finnish Heart Association

Biography Tuija Brax



*Tuija Brax, Secretary General, Finnish Heart Association
Lawyer, former MP and Minister of Justice*

The Finnish Heart Association's key objectives are strengthening the resources of the citizen, assisting to cope with heart disease, and promoting health. The Finnish Heart Association gives a voice to its members, and via counselling and education supports their mind-wellness, lifestyle, and offers peer-support. The Association's values are human dignity, expertise, trustworthiness, courage, and ambition. With these above-mentioned approaches, the Heart Association will enhance citizens use digital health and social care services.

Every Finn has connection to Oma Kanta archiving system which gives possibility to see his /her health data provided by different service providers. A person also has possibility to share his/her own data via Oma Kanta pages with professionals. To members of the Heart Associations it is important to have information related to blood pressure values, pulse rate, time of exercising and so on. Persons with chronic disease know they own health situation well, and would like health care personnels to respect their knowledge and use data what they are producing. The heart patients want to have continuing communication with professionals, evaluate the health objectives of their care plan, and guide decisions how to better health choices. For daily health decisions heart patients need health related knowledge and health literacy skills. Enlightened patient knows the risks. Unenlightened, doesn't.

Finland is ongoing a huge social and health care reform. The new social and health care system aims at strengthening the self-determination and responsibility of customer. For citizen/ patients as customers change makes possibilities to choose and use of multiple producers. We have a challenge how to guarantee that customer choices are made based on qualified health information instead on competing –advertising-provider information

Finnish National eHealth Award

Finnish National eHealth award is delivered by President and Secretary of the Finnish Society of Telemedicine and eHealth.

The Board of Finnish Society of Telemedicine and eHealth delivers annually national eHealth award. The award is based on significant accomplishments in the field of telemedicine and eHealth. The required activity can be for example a doctoral thesis in this area or some other important activity in the national or international level supporting the society's goals. The award is delivered during annual Finnish national conference on telemedicine and eHealth. In the year 2018, Finnish national eHealth award is delivered 15th time.

eHealth award arguments

The Board of Finnish Society of Telemedicine and eHealth decided to deliver three Finnish National eHealth Awards at the 23rd Finnish National Telemedicine and eHealth Conference emphasizing novel research, pioneering innovation services and significant lifework for the benefit of eHealth:

1. PhD Sari Palojoki's doctoral thesis "*The understanding and prevention of technology-induced errors in Electronic Health Records: A path toward health information technology resilience*" dissemination on social sciences and business studies was held on 21st of April 2017 at University of Eastern Finland. The purpose of the study was to provide a comprehensive picture of the characteristics of technology-induced errors in electronic health records (EHR). Palojoki developed and validated a new FIN-TIERA tool, which showed initial measurement properties, for proactively detecting and preventing errors from the user perspective. Refining existing safety monitoring systems and implementing the FIN-TIERA tool in healthcare will guide clinical EHR safety towards more resilient practice. The FIN-TIERA tool can be taken for trial use in a hospital environment and the study recommends tool's usage in the future as part of a Healthcare Failure Mode and Effects Analysis (HFMEA). Palojoki's research brings new knowledge for the healthcare information management and patient safety, and is relevant to practical work. The study showed that targeted training for EHR users will enable better coping when EHR risks are encountered. Studies in this thesis have also revealed many challenges in the existing patient safety monitoring systems.

Reference: <http://urn.fi/URN:ISBN:978-952-61-2460-5>

2. Oulu HealthLabs is a testing and development platform that provides innovators and companies in the health and welfare technology domain an integrated healthcare environment and feedback from health professionals. Oulu HealthLabs is consisting of three different sites, which offer an optimal choice for different ideas: OYS TestLab, Oulu WelfareLab and Oamk SimLab. Oulu HealthLabs concept was formalized in a three year EU-funded project and now it has been permanent since 2017. The concept was created to answer the demands set by the enterprises and it was based on former ten years old testing collaboration between health professionals and enterprises in the region. The services are provided as a product package suited for SMEs, too. The services cover a wide range of social and health care from specialized hospital care to primary and home care. OYS Testlab within Oulu Healthlabs consortium provides a secure development environment that is integrated to the most important patient information systems in Finland. Therefore it is possible to safely test and develop e.g. new IoT and eHealth solutions for citizens and professionals. OYS Testlab has to our knowledge the first in the world mobile 5G network environment in a hospital. By 2018, more than 150 enterprises and hundreds of health and social care professionals have participated in the collaboration.

References: <http://ouluhealth.fi/labs/> and <http://www.oys2030.fi/testausymparisto>

3. Mr Esa Siivola has a long time experience in telemedicine and eHealth, especially in video conferencing. He represents eHealth business field. He is well known and appreciated among health care professional who have 'struggled' with the technology during 1990-2000. He has actively shared information to end-users. Later on he has expanded his development work how to utilise versatile new technique in order to develop new Telemedicine and eHealth applications. He publishes a lot of articles and share information. Esa Siivola was a FSTeH Board member during years 1999-2003.

Reference: <http://www.vcu.fi/asiantuntija>

Session 2A: Cyber era in leadership and education

*Chair: Vice-Executive Director Frederic Lievens
International Society for Telemedicine and eHealth*

Thursday 15th of March 2018

15:10 – 17:00

2A-1 How data turned to insight and changed the business?

Hanno Nevanlinna, Director of Culture
Futurice

2A-2 Is there any role for a real-life physician in the future?

Santeri Seppälä, Director of Emergency Services
The South Savo Social and Health Care Authority, Finland

2A-3 Multidisciplinary Digital Health Education

Pirkko Kouri, Principal Lecturer
Savonia University of Applied Sciences, Finland

2A-4 Mutual Learning and Exchange of Health Informatics Experiences from around the world

Sabine Koch, Professor
Karolinska institute, Sweden

2A-5 Interpretive reflection in robotic surgery – can digital technologies enhance its learning?

Laura Seppänen, Senior Researcher
Finnish Institute of Occupational Health

How data turned to insight and changed the business?

Hanno Nevanlinna, Director of Culture

Futurice

Biography Hanno Nevanlinna



Hanno Nevanlinna, Director of Culture, Futurice. Hanno is one of Futurices founders. He's walked the path from a startup to an international company. During years 2004–09 he innovated, planned and built Finland's largest photo sharing service Kuvaboxi, 2008-2010 he founded the Futurice UX consultant team and during 2010–13 he led as head of HR Futurice to be the first company ever to be selected as Europe's best workplace twice in a row. Currently Hanno talks and teaches companies how culture and organisations are in the key role building successful digital services.

Customer centricity and data driven design are today's buzzwords. What is typically not seen is that these two words will end up changing all-together how the work is done and how management needs to transform itself to true leadership.

Is there any role for a real-life physician in the future?

Santeri Seppälä, Director of Emergency Services

The South Savo Social and Health Care Authority, Finland

Biography Santeri Seppälä



Santeri Seppälä is young medical doctor and Chief Physician and Director of Emergency Services at The South Savo Social and Health Care Authority. Santeri Seppälä is finishing his eMBA at the beginning of 2018 and specializes in healthcare. Seppälä is passionate in healthcare's digital revolution and has participated in many national and international groups focusing on Future of Healthcare.

Is there any role for a real-life physician in the future?

The average person is likely to generate more than one million gigabytes of health-related data in their lifetime that is equivalent to 300 million books. No human brain can cope with that amount of information. Last year we have heard that:

- IBM's Watson is better at diagnosing cancer than human doctors
- Google AI detects breast cancer better than pathologists
- AI on par with dermatologists at diagnosing skin cancer
- Radiology and pathology are soon gone

So it's seems the role of physicians is going to change fast.

But do we have any role left for a real-life physician in the future?

We have to remember that at the moment there is no such AI, algorithm or application's that would replace the human need to feel empathy, personal contact and to discuss with real life persons.

So yeah we are going to need real-life physicians in the future but their roles are going to be very different from what they are now.

Multidisciplinary Digital Health Education

Pirkko Kouri, Principal Lecturer

Savonia University of Applied Sciences, Finland

Biography Pirkko Kouri



Principal Lecturer in Health Care Technology. She is in charge of coordinating Master in Digital Health Programme at Savonia University of Applied Sciences, and she is the member of Savonia's multidisciplinary master programme team. She was during five years Savonia's representative and a member of national Master Programme team. Furthermore, she is the coordinator of China cooperation in Social and Health Care field. She has had many eHealth projects, from local- regional-national to international level. She has several memberships: the Vice President of Board of Directors in International Society of Telemedicine and eHealth (ISfTeH); Board member and secretary in Finnish Society of Telemedicine and eHealth (FSTeH); Member of IMIA-Nursing Informatics education-working group; Chair of Regional Cancer Association.

During two decades, the working life has changed. A combination of technology, economics and changing attitudes is forcing change upon both working and personal life. Digitalization challenges social and health care services. A new approach to social and health care services means that the client/patient receives all information about him or her and is equally involved in the decision-making about his or her own health and wellbeing. The retirement of older workers reflects on the development of working skills and expertise. The tacit knowledge of working life vanishes when people retire. Simultaneously with working life higher education organizations need to create new study programmes. To succeed in future working environment, people need to do things differently and be ready to learn new digital skills.

The core of Finnish university of applied sciences (UAS) education is interdisciplinary workplace-based and professional higher education. The UAS programmes are primarily targeted for those already in the working life, and thus applicants are required to have at least three years of relevant work experience after graduation at least bachelor level education. The master level the education is roughly divided to professional advanced studies and new generic studies meant for all master students. Multidisciplinary teacher group jointly set goals for courses, designed a syllabus, prepared joint lesson plans, taught students, and evaluated the results.

Huge amount of available information, digital devices, assistive devices, service design, and various digitalized solutions have the potential to anticipate health challenges and to improve lives in many ways. Simultaneously persons from various fields and working in the social and health care field need to acquire a range of new skills. Some skills are related to usability and service design, and some technical, such as how to get the most from new digitalized systems/processes or advances in secured technology. Some are organizational, such as how to work in multi-disciplinary teams, and how to manage professionals from different fields. Furthermore, the change also demands new attitudes, innovative working manner, finding ways in which the multi-professional persons can engage in effective partnerships in national and international context with both service users and the organizations that purchase social and health care on their behalf.

In addition, innovation in digitalized health field has a great potential to create large impact on modern social and health care. The essential tenet of the Master in Digital Health programme is that both person's health and wellbeing, and patient care outcomes can be improved and costs reduced through the effective use of digitalization in the social and healthcare transformation process. The Master's Programme is based on combination of modern working in health tech environments, encouragement of patient-centric solutions, leadership and information management, and data security and privacy issues. The presentation also shares the experiences of the first student group who started their studies in September 2017.

Mutual Learning and Exchange of Health Informatics Experiences from around the world

Sabine Koch, Professor

Karolinska institute, Sweden

Biography Sabine Koch



Sabine Koch is the Strategic Professor of Health Informatics at Karolinska Institutet in Stockholm, Sweden and director of its Health Informatics Centre. Dr. Koch received both a M.Sc. and a Ph.D. degree in Medical Informatics from Ruprecht-Karls University Heidelberg, Germany. Her early research was in dental informatics, especially dental imaging and IT supported integrated care concepts for dental offices. Her fields of interest include models for collaborative care, especially homecare, human factors/ usability and evaluation of information systems. Current research concerns a socio-technical perspective on integrating health, social and selfcare but also guideline-based clinical decision support and information visualization for enhanced decision making. Dr. Koch is the President-elect of the International Medical Informatics Association (IMIA) and Editor-in-Chief of Methods of Information in Medicine. She is a frequent member of the Scientific Program Committees for different international conferences in the field, associate editor of Applied Clinical Informatics and member of the editorial board of the International Journal of Medical Informatics.

Background: Massive Open Online Courses (MOOCs) offer new possibilities to reach large numbers of students with very different disciplinary and cultural backgrounds. Health informatics as a subject is interdisciplinary by nature. The challenges and opportunities of the field are global. Thus MOOCs may provide a good platform to address the global aspects of health informatics in an international environment. We designed a basic course in eHealth for care professionals, IT developers, patients and family carers with the aim to reuse parts of the course for our own health informatics education [1], and also to attract highly motivated and competent students for our campus education.

Aim: To report our experiences from the Massive Open Online Course (MOOC), “eHealth – Opportunities and Challenges”, run by Karolinska Institutet using the edx platform both as session-based and self-paced versions between 2015 and 2016.

Methods: “eHealth – Opportunities and Challenges” is a six-week introductory course in eHealth and health informatics targeting a broad student group without prior specific knowledge in the field [2]. The overall learning objectives of the course are to enable students 1) to describe different eHealth applications as well as enablers and barriers for their implementation; 2) to explain the importance of context, health informatics standards and terminologies for the design of eHealth applications and 3) to analyse eHealth strategies and discuss them in relation to the student’s specific context.

Course content covers the following topics: 1) Introduction to eHealth; 2) eHealth for care professionals; 3) eHealth for patients and citizens; 4) eHealth design; 5) Technical prerequisites; and 6) eHealth strategies.

The course was given in three different instances:

1. as session-based course, provided free of charge without the possibility to opt for paid-for-certificates (April-June 2015).
2. as self-paced course (same content as 1 and free of charge) (Dec 2015 – May 2016)
3. as session-based course with some revised/added content, provided free of charge with the possibility to opt for paid-for-certificates (Oct – Dec 2016).

At the end of each course instance, we distributed a link to an exit survey to course participants.

Results: In total, 13302 students had enrolled in the three different course instances and 573 (4.31%) students completed one of them. Most students were between 26 to 40 years old with a median student age of 32 years. 40.7% were female, 59.3% male. Most of them were highly educated with 49.8% having an advanced degree. Students came from 162 different countries whereof the most represented countries were the United States 15.9%, India 9.7% and UK 4%. Course participants had varying backgrounds. 44.6% had a healthcare background, 24.1% had a background in computer science, 7.9% were health informaticians, 1.9% policy or decision makers, 1.6% patients and 1.2% informal care givers.

331 students filled in the exit survey. 71.6% (n=237) perceived that they achieved all learning outcomes of the course to a large or very large extent. 74.9% (n=248) found to a large or very large extent that there was a common theme running throughout the course. 49.5% (n=164) said that they developed valuable expertise and skills to a large or very large extent. 87.3% (n=289) agreed or strongly agreed to recommend the course to other students.

As positive outcomes of the course, students highlighted set-up and content of the course, the pedagogical approach and the consistent international focus. Students lacked more practical case studies, more interactive discussions and proposed advanced follow-up courses on certain topics. Faculty lacked better functions for management of the discussion forum.

Conclusions: Experiences from our MOOC with participants from 162 countries highlighted both challenges and benefits [3]. A difficulty encountered by both students and staff during the course was the poorly designed discussion forum which affected the interaction in the course negatively. A major advantage of the MOOC was the mutual learning and exchange of health informatics experiences from around the world – a learning that would have been difficult to achieve in traditional learning contexts.

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Interpretive reflection in robotic surgery – can digital technologies enhance its learning?

Laura Seppänen, Senior Researcher

Finnish Institute of Occupational Health

Biography Laura Seppänen



Laura Seppänen, Senior Researcher at Finnish Institute of Occupational Health and docent at the University of Helsinki, has studied changes of work in various domains with a developmental approach, especially service networking. She is interested in changes brought by digitalization, robotics and platform economy and their impacts on learning possibilities at work. She is one of the leaders in a consortium Smart Work in Platform Economy (smartworkresearch.fi).

The introduction of a robot has considerably transformed both the surgical work by affecting the conditions of perception as well as the organization of operation room tasks.

Surgical operations are complex, and the robot still increases this complexity. In robotic surgery, like in other complex technology-mediated expert work, professionals need constant attention and judgement that can be called interpretive practice (Norros et al, 2015). Interpretiveness is able to respond flexibly to varying situational demands, uses multiple sources of knowledge including experiences and social communication, and is constantly able to learn by creating new collective knowledge.

While the robot poses considerable challenges for surgeons' learning of robotic techniques, it also offers new interesting possibilities for enhancing learning. Through a specialized endoscope lens and camera, the robotic device offers view of the field under operation, and also documents and archives operations in digital videos. These videos are a source for both individual and collective learning, reflection and evaluation over temporal and spatial limits. The robot augments transparency of surgical work.

In a recent study, a reflective video-based method was used to enhance interpretive way of working in robotic surgery (Seppänen, Kloetzer, Riikonen & Wahlström, 2016). While successful, the use of such a learning method is challenging to consolidate in the busy hospital life – and still, the quality of surgical work is of great importance for patients, hospitals and society. There is a need to find still new learning methods that are easily accessible, near to surgeons' work, and efficient. What possibilities can digitalisation offer for answering to these demands, and for enhancing interpretiveness in robotic surgery?

The presentation will, first, describe some of the challenges in learning robotic surgery, and how these can be understood in terms of interpretive way of working. Second, findings from the reflective video-based method will be presented. Third, the potentials of existing learning software for enhancing interpretiveness in robotic surgery will be discussed.

Session 2B: National and mobile eHealth (5 minute rapid presentations)

*Chair: Prof. K. Ganapathy,
Apollo Telemedicine Networking Foundation, India*

*Co-Chair: Co-Chair Faculty Member Claudia Bartz,
College of Nursing, University of Wisconsin*

Thursday 15th of March 2018

15:10 – 17:00

In order to help scientists strive for brevity and clarity in their communications, the organizers offer a new compact style of presentation at this International Meeting called "5 Minute Rapid" presentations".

Telefitting in the National Network of Teleaudiology – chance and opportunity for constant care of CI patients in Kyrgyzstan

Ass. Prof. Dr. Piotr Henryk Skarżyński Piotr Henryk^{1,2,3}, M.D., Ph.D., M.Sc.; Maciej Ludwikowski¹, M.Sc. MBA; Weronika Świerniak¹, M.Sc.; Prof. Henryk Skarżyński¹, M.D., Ph.D., dr. h.c. multi

¹*World Hearing Center, Institute of Physiology and Pathology of Hearing, Warsaw/Kajetany, Poland;*

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Background: Hearing implants' fitting is a clue component of postoperative patients' health-care, by providing the optimum auditory nerve electrical stimulation parameters. Its entails often long travels to medical center, associated with costs and time-consuming. To reduce patients' burdens, the World Hearing Center's team introduced in 2009 the National Network of Teleaudiology (NNT). Nowadays NNT consists of 21 cooperating centers in Poland and 4 abroad in the Kyrgyzstan (Bishkek), Ukraine (Odessa and Lutsk) and Belarus (Brest). The center in Kyrgyzstan is sufficiently equipped however programming of cochlear implant system, cannot be conducted by the team there due to a lack of trained specialists and limited experience.

Aim: The aim of this study is presenting the usage of telefitting between Poland and Kyrgyzstan.

Methods: The Internet allows specialists from Poland to set up a teleconference for audio and video contact with the patient and support specialist, and allows remote desktop software to access a remote computer and perform fitting. Every node is equipped with teleconference terminals from Polycom Inc. with LCD screens, zoomable and movable Polycom cameras, connected to a system with symmetrical Internet connections. There is also a PC computer equipped with clinical interface boxes with appropriate fitting software. The 'Logmein.com' application is used for remote control.

Results: In the Institute Physiology and Pathology of hearing teleconsultation procedure includes ENT examination, preparation stage and telefitting. During the preparation stage, a support specialist does a structure interview with the patient concerning hearing benefits, communication skills, and usage schemes in daily life. Afterwards is psychoacoustic measurements. The last step of preparation is consultation with speech therapist.

Conclusions: Optimal fitting of cochlear implant system is necessary for implanted patients to obtain maximum possible hearing benefits. Fitting of the system usually requires frequent visits in the International Center of Hearing and Speech and repetitive fitting sessions. However, tiredness connected with long travels very often affects the reliability of psychophysical tests and fitting sessions. Moreover, the costs of frequent travels are significantly high for many families. Fortunately, development of informatics and telecommunication technologies opens new possibilities for the patients and the specialists. The telefitting model increased accessibility to hearing care services in Kyrgyzstan.

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Increasing Need for an eHealth Impact Framework for Africa

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Background: Efforts by African countries to improve healthcare and citizens' health within challenging resource limitations put considerable pressure on investment decisions. eHealth is believed to have potential to strengthen health systems and is now seen by some entities as a determinant of health, yet its impact is not well estimated in advance or measured after implementation. This is an obstacle to the effective allocation of healthcare resources and limits national and regional ability to develop eHealth and realise its potential in health systems transformation.

Aim: A broad conceptual framework for appraising eHealth impact could help selection of the best course of action by informing individual steps, including: identification of promising initiatives, choosing between eHealth options, managing implementation, preparing for obsolescence, analysing achievements, and promoting sustainability. Such insight could help strengthen and transform healthcare, provide benchmarks for Monitoring and Evaluation (M&E), and improve individual and population health. Such frameworks exist, but do not address the needs of African countries.

Methods: Desktop review of literature gathered during several previous studies on the economic aspects of eHealth initiatives in African countries.

Results: Unique aspects of Africa's health context are clarified, particularly relating to resource constraints and health strengthening priorities. Key issues that influence eHealth development are highlighted, such as addressing affordability, value for money and risk.

Conclusions: The paper presents the role of eHealth impact appraisal in appraising eHealth options for African countries and describes aspects critical for an eHealth impact framework for Africa.

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Multidisciplinary Teleconsultation in Developing Countries

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Global Health Telemedicine (GHT) is a non-profit organisation that was set up in 2013 to provide telemedicine services in developing countries, mainly in sub-Saharan Africa. The GHT telemedicine centre collaborates with the traditional healthcare centres and hospitals that are already present in the country. GHT's offer of diagnosis and therapy consists of providing remote teleconsultation by medical specialists working in Europe, to the physicians working in the country requesting the service, who are often general practitioners.

Materials and methods: The existing local health centre is provided with a complete telemedicine centre that includes: PC with internet connection; Electrocardiograph with Bluetooth connection; Oximeter with USB connection; Phonendoscope with USB connection Backlit panel (diaphanoscope) for viewing x-rays; HD video-camera with USB connection. During the outpatient medical examination, the local physician obtains all the clinical and laboratory data and images that need to be attached to the request for teleconsultation. The physician connects to the online platform and prepares for the teleconsultation by entering: the patient's personal details and clinical history that the local healthcare centre has, as an attachment; a description of the problem with the medical question and laboratory data to support the images (laboratory tests, ECG, oximeter, photographs, videos) as attachments. The physician chooses one or more medical specialities to which to send the request for teleconsultation. He sends the request for teleconsultation through the online platform and gives it a colour code (triage) to indicate how urgent it is. The request appears on the internet in real time. All the specialists belonging to the specialisations requested receive a text message/email that inform them of the request for teleconsultation. The specialists use the same platform and can answer with therapeutic advice or by requesting further diagnostic tests. The physician thus receives real specialist teleconsultation, which is recorded in the patient's file with the name of the specialist who provides the consultation and is visible on the internet in real time as soon as it has been sent.

Findings: Twenty-Eight Telemedicine Centres have been opened in four and a half years: six in Malawi; four in Mozambique, Republic of Guinea and Tanzania; three in Kenya and one in Cameroun, Central African Republic, Democratic Republic of Congo, Egypt, Nigeria, Swaziland Togo and one web jolly in Rome, Italy. We are able to offer specialist teleconsultations free of charge in 18 medical specialities: Angiology, Burns, Cardiology, Dermatology, Endocrinology, Haematology, Infectious Diseases, Internal Medicine, Neurology, Nutrition, Oncology, Ophthalmologist, Pain Therapy, Orthopaedics, Pain Therapy, Paediatrics, Radiology, Surgery and Urology. We provided 1,553 teleconsultations between 1st February and 31st October. The specialities requested most were: Cardiology 36.4%; Infectious Diseases 21.2%, Dermatology 10%; Radiology 9.5%; Internal Medicine 6.4%; Neurology 5.7%, Orthopaedics 4.6%; Burn 4.2%, Surgery 3% and other 3.2%. The colour code assigned according to how urgent the request was: Green 41.4%; White 27.3%; Yellow 22.5%; Red-Emergency 8.8%.

Conclusions: Since GHT was set up in March 2013, it has provided 5,246 teleconsultations, 1,553 of which during the last 20 months, which is 29.6% of the total, which shows the programme's growing success. The data regarding the urgency of the teleconsultations indicate that our local staff use the telemedicine service above all for outpatients' consultations that are not urgent (68.7% of the total, white + green), and that the chronic, degenerative cardiovascular diseases (arterial hypertension, heart failure on ischemic and hypertensive cardiopathy, diabetes mellitus) are the most frequent clinical problems for which teleconsultation is requested. The increase in chronic, degenerative pathologies related to the aging of the population is in fact relatively unknown in developing countries and it is creating serious problems for the national healthcare systems of these countries, above all because of the lack of resources available for training specialised medical staff. Together with the typical pathologies of tropical climates, that is infectious diseases, thanks to the improvement in the quality of life and the increase in life expectancy, there is also an increase in cardiovascular, rheumatic, metabolic and oncological pathologies. The local medical staff have always been trained to manage the most widespread infectious diseases (HIV, TB, malaria) and they are therefore not ready to manage such a large number of pathologies and although these pathologies can be treated in an outpatient setting, they still have to be treated by specialists. Our programme offers specialists a second opinion and thus guarantees not only a consultation that is certainly useful for the physician and his patient, but also a form of continuous e-training for the local medical staff.

Interprofessional Collaborative Urotelehealth Program in Rural Northeastern Ontario - Patients' Perceptions

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Introduction and Objective: Found in several locations across the Province since 2006, Ontario Telemedicine Network (OTN) offers face to face information sharing by instant videoconferencing adding significant benefit to timely health care delivery to patients in rural and remote communities. We encouraged inter-professional collaborative care where the patient, the relatives the primary health care provider or support worker and the specialist (urologist) all meet at the point of care by Telemedicine. By January 2015, we attempted to determine through a questionnaire survey how the patients and their relatives perceived this pattern of care.

Materials and Methods: Approval was received from the Ethics and Review Boards of the Kapuskasing and the Kirkland Lake hospitals. Data were collected by paper and pen questionnaire Informed consent was obtained from participants. Diagnosis, Treatment, Number of Telemedicine encounters and outcomes were recorded. Information regarding computer and internet use among the patients' relatives was also obtained. Quantitative and qualitative data were analysed using the Statistical Analysis Software (SAS) and conceptual matrix respectively.

Results: 124 patients have completed the survey- 74 men and 48 women aged between 31 and 92(average 64) years. Cancer diagnoses and the elderly with multiple co-morbid conditions were predominant. Spouses comprised 90% of all accompanying relatives. There were 8 primary health care providers/care givers. Patients and relatives were satisfied with the care provided with timely access nearer home; cost saving (gasoline, food, time off work) and minimal travel time especially during the winter.

Conclusion: This study suggests that patients and their relatives value Telemedicine assessment because it helps to minimize travel, reduces cost, time off work and provides appropriate care by the "Care" team. Further experience with this pattern of care and its ramifications is required. Visits to Physicians offices for minor assessments may soon become virtual in time and space.

Deployment of National Kanta Services 2010–2017

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Background: Kanta is the name of the Finnish national data system services for healthcare services, pharmacies and citizens. The Kanta Services form a unique statutory service concept, which has been introduced in phases. Legislation became effective 1 July 2007. The main services include the electronic prescription, My Kanta pages, Patient Data Repository, and Pharmaceutical Database. Fairly soon the services will include social care data, too.

Methods: Electronic prescription. The first electronic prescription was written in Turku in 20 May 2010, it was dispensed in a Turku pharmacy, and data were stored in the ePrescription service. Some 98% of the pharmacies (815 pharmacies and subsidiaries) subscribed the service in due time (by 31 March 2012). Some 95% of the public healthcare providers subscribed the service in due time (by 31 March 2013). Private healthcare providers were due to subscribe service in two phases according to the Parliament degree: providers that prescribe more than 5000 prescriptions annually were due to subscribe the service by 31 March 2014, and the rest by 31 December 2017. In Finland electronic prescription became mandatory 1 January 2017.

Patient Data Repository. A production pilot of the Patient Data Repository service was run in Kuopio from mid-November 2012 till mid-February 2013. The service was first subscribed by East Savo Hospital District in early November 2013, and a large-scale deployment in public healthcare started in March 2014. There were 57 (33%) public healthcare subscribers by 31 August 2014 (deadline set by the law) covering a population of 1.6 million. All public healthcare providers had subscribed the service by early December 2015 (100% population coverage). The first Patient Data Repository user in private healthcare joined the service in early February 2016.

My Kanta pages. At the same time Kanta Services were opened My Kanta pages were available for citizens via internet web-service (www.kanta.fi or www.omakanta.fi). In the beginning, My Kanta pages were available for adults (i.e., 18-year-olds or older) only, and just recently for caregivers of up to 10-year-old children.

Results: Electronic prescription. In May 2010–November 2017 physicians wrote 132.0 M electronic prescriptions in their EHRs that were transmitted as encrypted messages to the national ePrescription Service. Some 226.7 M purchases based on those prescriptions have been dispensed at the pharmacies. Physicians wrote in January–November 2017 a total of 29.477 M prescriptions, out of which 28.5 (96.6%) M in their EHRs and 0.29 (1.0%) M with Kelain prescription web-service. In addition, they wrote 0.25 (0.8%) M paper and gave 0.12 (0.4%) M telephone prescriptions that were turned into electronic prescriptions by the pharmacies. In 2017 till 30 November there have been 55.7 M dispensing events of prescription medicine at the pharmacies (100% from electronic prescriptions). All the public and 1262 private healthcare providers have subscribed the ePrescription Service by 30 November 2017.

Patient Data Repository. All public and 265 private healthcare providers have subscribed the Patient Data Repository service by 30 November 2017. There were 944.35 M patient documents registered/archived of 505.3 M service events from 5.75 M persons in the Repository by 30 November 2017. In 2017 there have been 345.02 M documents registered in the Repository. Persons have given 5.52 M informings, 2.84 M consents, and 0.07 M denials. In addition, persons have registered 0.27 M wills.

My Kanta pages. There have been 31.32 M logins by 15.92 M visits by 2.34 M persons at the My Kanta pages by 30 November 2017. In addition, there were 3.76 M requests for electronic prescription renewals, and 0.98 M visits on behalf of another person (children <10-year-old) in/via the service. In November 2017, there were 1.33 M logins by 0.60 M visits, and 0.20 M electronic prescription renewal requests.

Data Repository for Social Services. There are currently five pilots ongoing, the purpose of which is to start national Data Repository for Social Services production in spring 2018. A state sponsored project has already produced 1630 registration coaches and 21 networks that have further facilitated registration events based on education and web-modules for 8199 social care professionals. According to the programme schedule, the pilots will start service production in spring and the others in autumn 2018.

Conclusions: The Finnish national Kanta Services are deployed, and their use has increased in function of deployed services and number of subscribers. They will be further enlarged and modified according to the needs of patients and customers, professionals, organisations and other stakeholders.

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Virtual hospital 2.0 – modelled cost-benefit assessment: Towards potential economic efficiency with digitalization and customer-responsive services

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Background: Customer-responsive services is a key project in the Health and wellbeing development of Finnish government [1–2]. An essential part of these new services is Virtual hospital 2.0 (VH2.0, Virtuaalisairaala 2.0 [3–4]), a joint project between Finnish university hospitals, which population responsibility and catchment area cover all Finns. VH2.0 develops client-oriented digital specialised medical care services to citizens, patients and professionals. VH2.0 production and implementation happen in Virtual village (Terveyskylä [5]) together with virtual hospitals (sc. Houses). Service offering information, advice, self-care, symptom navigators, digital treatment pathways, and tools are offered. VH2.0 together with its Innovation farm, Centres of excellence and Health village have been a true Finnish success story, including currently 20 houses for 85 patient groups and some 80,000 visitors/month. Yet, every true social and health care success story must confront a health economic evaluation (HEE) to assess its value for decision makers.

Aim: To carry out a third-party mid-term HEE of VH2.0. HEE's special focus was cost-benefit analysis (CBA) in terms of potential health care capacity freed by VH2.0 at Helsinki university hospital (HUS) and at national Finnish level.

Methods: The CBA was done as dynamic predictive modelling using a decision-analytical modelling approach. The modelling accounted for the expected over-time changes in resource use, unit costs and population structure for two key scenarios: VH2.0 and current practice. The approach covered expected health care visits, treatment letters, calls, e-appointments, e-messages and travelling during years 2017–2021. The primary outcome was the potential capacity freed with VH2.0 in year 2016 value (i.e., no discounting or indexing was done) vs. current practice. Payer perspective excluding e.g. taxes and productivity losses of customers was applied.

Results: Over the years 2017–2021 at the HUS level, the average potential capacity freed annually with VH2.0 was predicted to be around €42 million for the first five years, summing up to around €208 million potential capacity freed until the end of year 2021. Among the CBA parameters, the five most important key value drivers for HUS VH2.0 in the order of importance were treatment calls, revisits, treatment visits, travelling, and first visits. Over the years, the average potential capacity freed annually with VH2.0 was predicted to be around €261 million at the national Finnish level for the first five years, summing up to around €1.3 billion in Finland until the end of year 2021. The five most important key value drivers were revisits, treatment calls, travelling, treatment visits, and first visits.

Conclusions: VH2.0 may complement the traditional treatment pathways efficiently, potentially freeing a substantial capacity for other purposes through the production technology change. From the perspective of opportunity costs, such technological revolution is very valuable and capacity freed can produce significant effectiveness elsewhere [6]. However, after these predictions, the implementation, evaluation and assessment of best practices is warranted. In the larger landscape, VH2.0 is aimed to improve the equality of citizens by making healthcare services available to all Finns regardless of their place of residence and income level, a target supported by the travelling costs of this CBA. Services are expected to be suitable for monitoring the quality of life, symptoms and lifestyle, and long-term illnesses. Hopefully the VH2.0 data will be available through Isaacus, the Finnish national service operator for health data [7].

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Multidisciplinary Digital Intervention for Youth and Children in Kuopio Public Oral Health Care – the ODA Pilot Project

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Background: Oral health habits among the Finnish youth and children are alarming; only two thirds of school girls and less than half of school boys meet the required brushing frequency of twice a day [1]. Persisting poor oral hygiene habits may result in poor oral health. The underlying causes of ill oral health may be consequences or indicators of a wider life issue [2]. Hence, it would be important to recognize and tackle the underlying causes early on. This should be conducted by an intensive multidisciplinary collaboration among healthcare and social services [3]. However, the current state of practice does not support this workflow well enough. Oral health professionals have only turned to child protection services in case of severe negligence of a child's oral health. Furthermore, the patient's background information can't be pre-inquired and health education is provided only during appointments. Digital patient profiling tools could provide an early, efficient and cost-effective solution for patient pre-profiling, case management, individual intervention and follow-up.

What for is this project: In Kuopio City Oral Healthcare ODA Pilot Project, the aim is to recognize compromised individuals digitally with an interactive oral health anamnesis. Based on the questionnaire, an algorithm creates a patient profile for further care management. Concerning individuals are provided with a fast access appointment to an oral hygiene counseling clinic. At the appointment, the patient's oral health and psycho-social status is evaluated by the professional, who categorizes the patient's level of concern from one to three. The professional creates an intervention plan for oral health and gathers a support team of multidisciplinary professionals. Digital modules are applied for patient-team communication purposes (chat-service) and for oral self-care application (individual dental status, brushing games, photo food diary etc.). The final digital platform will be available in spring 2018. The effectiveness of the project will be evaluated i.e. by monitoring the number of interventions, changes in clinical indexes, invasive treatment need and improvement in self-reported oral health.

Preliminary results and discussion: Currently the treatment flow has been tested during five months in traditional way of practice. Patients are sent to an oral hygiene counseling clinic in case of a concern. The counseling clinic coordinates the previously described interventions. Between 1.6-31.10.2017 there have been 20-45 monthly interventions, which have resulted in significantly improved self-reported oral health. Other indicators will be reported annually. Patient and staff satisfaction have been extremely encouraging. Launching of the digital platform is expected to accelerate the recognition of compromised patients and provide effective, user-friendly tools for patients and professionals.

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Self-care and digital value services as part of comprehensive school aged children and their families' welfare

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Background: The general wellbeing of Finnish population has improved in recent decades, but at the same time psychosocial support needs of families and socioeconomic differences have increased between population segments that have impact in the daily lives of families with children [1]. It is extremely important to take socioeconomic differences into consideration to provide equal services for all and to increase community resilience. At the moment Finland is ongoing one of the biggest ever administrative and operational reform in health, social services and regional government. The reform affects the services of every citizen in the country. Digitalisation has a major role in the reform and promotes the user-centric approach in the services.

The Finnish Government has initiated a key project (2016-2018), self-care and digital value services (in Finnish "Omahoidon Digitaaliset Arvopalvelut"), which is driven by a vision of a new service model in healthcare and social welfare services. The project is a joint effort of twelve Finnish cities and two hospital districts. The City of Kuopio is one of the pioneers that contribute to the project.

Aim and Purpose: The aim is to provide tools for psychosocial support for the comprehensive school aged children and their families' concerns related to their welfare by applying operational changes and new digital services. The purpose is to enable identification of possible risk factors and the potential need for support at an early stage. The current operational process where different stakeholders meet child/family separately will be changed so that multiprofessional stakeholders will gather together with the child/family.

Methods: The mandatory extensive health check-ups at school health services that covers entire age group was chosen as starting point to identify risk factors from check-up questionnaires (in paper form). Data was collected from the extensive health check-up questionnaires for parents (n=475, collected from 8 primary schools with more than 300 pupils, children born 2005). According to data, 24% of these families raised concerns about family / child wellbeing. This data enabled to develop method for nurses to identify family concerns and their support needs. At the same time service process was adapted for digital services to provide decision support for the professionals based on digital data (paper forms replaced).

Results: As a result, new multiprofessional operational processes have been implemented. When needed, families are able to meet more easily all the professionals together; school health services, social services, dental health care, student services and services for families with children. Interventions have been intensified by using specific statistical code for concerns for identification. New e-services for child/families are being implemented: welfare control, self-care plan, welfare coaching, assessments of symptoms and welfare, welfare plan.

Conclusions: Self-care and digital value services are already here. New services provide new tools and approaches that will help to provide targeted support for comprehensive school aged children and their families' welfare concerns. At best, digital services bring services more accessible for the customer and can provide new tools to reach help when needed. In the long term we expect that the most expensive child protection costs will decrease.

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Smart Digital Solutions for Future Ageing

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Background: People are living longer than ever before: in Australia (typical of developed countries) it is estimated that by 2036 over 20% of the population will be >65yo and average life expectancy will be 85yo (1). This will have a profound impact on families, communities, society, health systems and the economy. Today's older citizens wish to remain living in their own homes and to pursue an active lifestyle as long as possible, with appropriate support where necessary. We need to develop a variety of approaches to deal with this transformation, some of which may depend on digital technologies.

Aim: This research study identifies the major needs for individuals of a future ageing society which can be potentially addressed by digital solutions. Before developing these solutions it is important to understand their scope and to be able to prioritise and leverage common or related elements of them to derive the best outcomes. This can be achieved by use of a high level framework within which digital solutions for different purposes can be considered: the identified major needs provide the basis for describing such a framework.

Methods: Structured interviews were conducted with approximately 50 Australian business entities representing a wide cross section of organisations involved with services for ageing. These included companies and not-for-profits engaged in community and aged care, hospital and acute care, primary care, nursing and allied health, finance, insurance, technology, software, built environment and urban design. Further consultations involved local and state government departments and peak professional bodies operating in the ageing sector, as well as ageing consumers. A pro forma survey instrument was developed to elicit problem statements and responses were subjected to topic clustering to extract common themes.

Results: Two major areas for digital solutions emerged from the survey: supporting "Ageing in Place" where citizens wish to continue living independently and maintain responsibility for their own health status by accessing external sources of support, and "Ageing with Care" where it is necessary for them to live in conditions of clinical management in specialised ageing facilities with associated inhouse professional support.

- For "Ageing in Place" the dominant needs for solutions were identified as:
- Achieving Personal Wellness (with information gathered from about daily health related lifestyle habits of an individual as well as summary data from digital monitoring sources and records of health check events);
- Maintaining Community Connections (with a social networking online environment to enable individuals to establish and maintain a personalised set of community based group interactions and event participations);
- Reducing Adverse Events (using a "Health Smart Home" platform system for continuous surveillance of occupants, with multimodal sensing and pattern analysis to prompt alerts if anomalous situations are detected).
- For "Ageing with Care" the dominant needs for solutions were identified as:
- Personal Health Trajectories (representing and modelling of an individual's 'health trajectory' based on health records and contributed data, mapping their advance through the ageing life course);
- Chronic Disease Management (via a generic software system including data collection and management, analysis of trends and recommendations on actions related to health condition self-care);
- MyCare Consumer Portal (software system integrating information across service providers aligned with health data derived client profiles, and sharing health history and choices with clients/carers).

Conclusions: The focus of this program of work is on creating a capacity that enables us to identify and describe the needs and issues of older people and care providers and which allows us to work collaboratively to design, build and deliver solutions to those who need to apply them or use them. Through the coordination of research and development activities addressing these needs across diverse disciplines, organisations and sectors, innovative solutions can be developed which will create impact at scale.

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Effects of ubiquitous 360° patient counselling environment on cardiological patient's health-related quality of life

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Background: Ubiquitous environment means an environment that is present throughout the merging technology, enabling individual learning and counselling to its user at an appropriate time and in an appropriate manner. In this study, the ubiquitous environment is a 360 ° panoramic photo-based network environment, incorporating digital materials that enable versatile authentic counselling.

Aim: The purpose of the study is to evaluate the effectiveness of the ubiquitous counselling environment in the health-related quality of life of the patients with coronary artery angiography.

Methods: In the planning phase of the intervention, a systematic literature review describes the ubiquitous counselling environments and their effectiveness in long-term patients.

In the evaluation phase of the intervention's feasibility a) the ubiquitous counselling environment with its materials will be developed in cooperation with cardiac patients, healthcare and IT professionals and health care students b) the usability of the environment will be pretested in the pilot: the cardiological patients (n = 10), the cardiological health care professionals (n = 10), health care students (n= 30) and an information technology expert (n = 1) use ubiquitous counselling environments for a month, after which they are interviewed on a structured form. The interview explores user experiences on the feasibility of the ubiquitous control environment. The material is analyzed by deductive and inductive content analysis.

In the evaluation phase of the intervention, Oulu university hospital's coronary artery angiography patients will be randomized in RCT-study design to the test and control groups (50-60 patients / group). The test group is counselled in the ubiquitous environment, the control group receives counselling in accordance with current practice. The data is collected with a valid health-related quality of life instrument (eg RAND-36) before and after the intervention, assessment takes place before, 6 and 12 months after counselling intervention. The data will be analyzed statistically using the SPSS software package.

Results and Conclusions: Data collection and analysis is going on, the first results will be reported as a poster in the congress. The research faces the challenge of health care digitalization and is important both nationally and internationally. Comparable patient counselling environments using similar technology have not been reported nationally or internationally in previous studies. The research will be carried out in a multidisciplinary Tekes-funded project, in cooperation with healthcare staff and students as well as information technology industry representatives. The wider usage of the developed environment is significant.

Special Interest Group Tel@ Amazonia: telehealth intervention for security food and nutrition of mothers and babies in the deep rainforest
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Background: The Brazilian state with the largest number of indigenous people is the Amazon, representing 55% of the total of the North region of the country 1. The literature shows a nutritional and anthropometric profile with high prevalence of height and malnutrition deficits in indigenous children in Brazil, associated with poor socioeconomic and environmental conditions. 2,3,4 Malnutrition in the indigenous population is one of the biggest public health problems of the country and one of the main causes of morbidity and mortality among indigenous children. Other causes that raise indigenous mortality rates are infectious and parasitic diseases 5. In order to fight against this problem this problem, we will carry out an experimental study in which there will be activities of permanent education with primary health care professionals and midwives. Updated guidelines will be provided on food for pregnant women and mothers with children accompanied by the childcare service in the indigenous areas of the state of Amazonas, where there are telehealth units.

Aim: The main objective is to help achieve the normal weight of the indigenous population 0-5 years, based on nutritional counselling with an emphasis on the nuclear family. The specific goal is to create differentiated menus, which supply the nutritional deficiencies according to the tradition and beliefs of the territory.

Methods: The intervention to be implemented will be a series of online meetings through the internet between the multi-professional and international team of researchers aimed at healthcare professionals and midwives at the telehealth centres in the state of Amazonas. To monitor the intervention, the prevalence of weight deficit will be observed among the children attending the childcare clinics of the participating health units, as well as the changes in the health practices of the participating health professionals through qualitative verification in focus groups.

Results: Three Special Indigenous Health District (DSEI) were chosen to compose the case-control study, during 18 months: (1) Alto Rio Negro, (2) Alto Rio Solimões and (3) Médio Rio Purus. The DSEI Médio Rio Purus, with 87 indigenous villages and 9 ethnic groups, doesn't have telehealth centre to assist the healthcare local network. It will be our control arm of the study. The DSEIs Alto Rio Negro and Alto Rio Solimões, with 862 indigenous villages and 30 ethnic groups, have telehealth centres and border with Colombia.

Conclusion: Preliminary results of the literature review point to underreporting of local healthcare data and there is low adherence by professionals to recommendations, regarding nutritional counselling. The control-case study showed be the best research design to monitor and evaluate the telehealth intervention, but it has its limits to present this complex reality. This is a great challenge for the multidisciplinary team.

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Mobile application – new telemedicine tools?

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multi

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Background: Due to the growing interest in new technologies, the developers of mobile applications have created a series of tools that can be potentially useful also in the clinical practice. More and more applications are introduced in the audiology field, utilized for instance in the assessment of hearing or helpful in reducing the severity of tinnitus.

Aim: The aim of the study is to check the effectiveness of selected applications in the field of audiology.

Methods: The first study with uSound application involved 20 people aged 17 to 67 years of age. None of the respondents reported hearing problems. The second study with ReSound Relief application involved 30 people aged 19-65 hospitalized due to tinnitus at the Institute of Physiology and Pathology of Hearing. All patients used the application for 3 months. The results obtained with the uSound application were compared with the results obtained with the device used conventionally for performing hearing screening tests. The second application - ReSound Relief – was created to help patients reduce the severity of tinnitus. Due to the subjective nature of the problem of tinnitus, the effectiveness of the application was evaluated based on the results of standardized questionnaires.

Results: The preliminary results indicate that uSound application is helpful in establishing the hearing threshold of adult patients without hearing problems, comparably to the currently used devices routinely used in the hearing screening programs. The ReSound Relief application seems to be effective and patient-friendly tool enabling for tinnitus severity reduction.

Conclusions: The possibility of using mobile applications in everyday practice is a relatively new direction of research in the audiology field. Current data suggest their effectiveness in different hearing-related domains.

Telehealth in India: Illustrations from Apollo Telehealth

K.Ganapathy MD PhD¹, S.Premanand MBA¹, N. Lovakanth M.Sc¹, Vikram Thaploo MBA¹

¹*Apollo Telehealth Services, India*

Aim: This presentation will summarise four representative projects being executed by Apollo Telehealth Services (ATHS) the oldest and largest multi speciality telehealth network in South Asia. A) Through an innovative first of its kind PPP telehealth services are being provided in the Himalayas to a remote isolated district of 34,000 at a height of 3800 m with temperatures of -25C. On a Program Management Mode (PMM) using Point of Care Diagnostics even 24/7 tele emergency services are provided. Operational details will be discussed. B) 164 e Urban Primary Health Centres were entrusted to ATHS by a state Govt. Deploying state of the art ICT 1.7 million consults were provided of which 0.1 million were teleconsults. The challenges encountered will be highlighted. C) Telemedicine centres have been set up in remotely located Govt of India power stations where providing health care had been extremely difficult. D) Promoting Wellness the eWay is another major initiative. Health Literacy is being promoted in 10,000 plus individuals. This presentation will discuss how these issues are being addressed deploying ICT.

Methods: A tailor made specific solution was customised for each project after a detailed need assessment study. ATHS took full responsibility for the entire project and was answerable only to the funders. The individual beneficiary did not have to pay for the services provided. Meticulous documentation, regular reviews resulted in real time corrections if required. As all the projects were truly unique there were no precedents to fall back on. The advantage was that there were no legacy systems to disinherit. Though projects were diversified, pro active measures by dedicated coordinators ensured outreach activities. A specific call centre team ensured follow up studies.

Results: A) Of the 9194 teleconsults given in 31 months 638 were emergencies. 5843 tele laboratory investigations were done. 19 cases of myocardial infarction were remotely diagnosed and six tele thrombolysed. Telementoring of 7 cardioversions using a defibrillator was carried out. Tele Cervical cancer screening was done for 59 women. B) 6.07 of 1.67 million consultations (13 months in 164 centres) were specialist teleconsults in medicine, cardiology, endocrinology and orthopedics. Introducing EMR and creating a live dashboard for the government @ <http://www.euphc-ap-gov.in/#/DASHBOARD> was a herculean task. C) In 22 weeks 686 teleconsults have been given at the National thermal Power Corporation Bongaigaon refinery This includes emergencies D) Of the 0.44 million screened for NCD's 3150 had real time teleconsults in a camp mode (from colleges, industries and urban slums). Illustrative cases where the tele consult made a difference will be presented.

Conclusions: A Programme Management approach with community outreach, optimized capacity utilization, ongoing impact assessment, process re engineering, with confidence, knowledge and experience helped make the impossible possible. Remote healthcare delivery, in a PPP mode is socially relevant, financially sustainable and scalable. With the right partners, it is possible to innovate, customise and scale up remote healthcare even in inhospitable terrains. Tele Laboratory services and tele literacy programmes are value added services. From pilots to proof of concepts ATHS is slowly but surely integrating telehealth into the core of the health care delivery system in India and making the impossible possible.

Session 3A: Benchmarking nationwide eHealth communities

*Chair: Prof. Yunkap Kwankam, Executive Director,
International Society for Telemedicine and eHealth*

Thursday 15th of March 2018

17:40 – 19:30

3A-1 Citizen experiences of eHealth services

Hannele Hyppönen, Research Manager
National Institute for Health and Welfare, Finland

3A-2 Fundamental change in Health professionals' tools

Jarmo Reponen, Professor
University of Oulu, Finland

3A-3 Nordic Countries: how eHealth revolutionized Health policies

Arild Faxvaag, Professor
University of Trondheim, Norway

3A-4 Countries' readiness to utilise EHR system data to advance healthcare and medicine

Jillian Oderkirk, Senior Economist and Policy Analyst
OECD Directorate for Employment, Labour and Social Affairs

Citizen experiences of eHealth services

Hannele Hyppönen, Research Manager

National Institute for Health and Welfare, Finland

Biography Hannele Hyppönen



Hannele Hyppönen, PT, PhD, acts as research manager in National Institute for Health and Welfare in Service System Research Unit. Her expert area is eHealth benchmarking and evaluation. She has a long experience in clinical work, a master's degree and doctorate in University of Helsinki (organizational learning and sociology of technology). She has worked in National Research and Development Centre for Welfare and Health (STAKES) since 1996 and in National Institute for Health and Welfare (THL) since 2009, leading the national eHealth assessment work, and also the Nordic eHealth indicator development work under the Nordic Council of Ministers. Current activities include leading the STePS -programme for national eHealth benchmarking commissioned by the Ministry of social affairs and health, work for the IMIA WG Technology Assessment & Quality Development, and participation in several eHealth research projects.

Background: Finnish people use the Internet for a wide variety of purposes, and the citizens possess good basic capabilities in terms of both IT skills and attitudes for also adopting internet and mobile-based services. In 2014, the Ministry of Social Affairs and Health published a strategy "INFORMATION TO SUPPORT WELL-BEING AND SERVICE RENEWAL eHEALTH AND eSOCIAL STRATEG2020" to promote use and benefits of eHealth and eWelfare services. The objectives of the target area for the citizen are 1) that citizens use eHealth and eWelfare services and provide e-information for professional use to help the citizens in life management, prevention of health problems, self-assessment of service needs and independent coping.; 2) that electronic services are available, and 3) that service quality and availability information are available to the citizen electronically, to increase freedom of choice.(1)

Aim: The aim of this study was to assess the extent of meeting these strategic goals from the viewpoint of citizens in 2017. Research questions were: 1) To what extent do citizens use different services? 2) What are the barriers for using eHealth and eWelfare services? 3) What are the benefits of eHealth and eWelfare services?

Methods: A questionnaire for citizens on the use and experiences of e-services was conducted in 2017 as part of the THL FinSote survey (former ATH survey) for randomly selected people. The size of the sample taken by the Population Register Center was 10,000 (response rate 45%) and was targeted by the entire Finnish adult population up to 20 years of age. The elderly (over 75 years of age) were picked up with double probability to match the number of other age groups. The results were weighted to match the population. The results were compared to a corresponding data for year.2014 (2).

Results by research question (3): 1) To what extent do citizens use different services? Almost 90% of the respondents used the Internet for electronic services in 2017, and their share had remained at the level of the previous survey (5). Altogether 78% of respondents informed that they were able to use at least basic functionalities of electronic services independently. In 2017, 68% of all respondents had used an eHealth or eWelfare service during past year. This is 10 percentage units more than in 2014. There was most increase in e-viewing of own health data, laboratory results and e-renewal of prescription (functionalities of national MyKanta pages).

2) What are the barriers for using eHealth and eWelfare services? More than half (54%) of the respondents completely agreed with at least one barrier to e-service use listed in the survey. The barriers had remained very similar to those of the 2014 survey: The biggest barrier was belief that personal meetings cannot be replaced by e-mail (35% of respondents fully agreed) and that the terms of use are too complicated (20% of respondents fully agreed). One fifth of respondents felt that they did not have the skills to use electronic services, and 15% did not have computers and internet access.

3) What are the benefits of eHealth and eWelfare services? Nearly a quarter of respondents fully agreed that electronic services support self-care of health / well-being. More than a third of the respondents thought that saving time and money, improving their care, and speeding up access to services (41%, 33% and 33% of the respondents fully agreed) were a major benefit. Of the respondents, 31% estimated that the electronic service has saved traditional visits. The most significant savings (averaging 27 saved traditional contacts per year) seemed to originate from electronic monitoring or measuring own health / well-being. However, only a few people estimated the savings of this service and the SD was very high (SD 88.2, range 0-365 saved visits/

year). The electronic information on health, illnesses and their care was estimated to save an average of 5.6 conventional contacts per year. Also, the electronic application for social services, virtual peer support groups and service directory had saved over 3 traditional contacts per year

Conclusions (3): Although the supply of e-services has substantially increased in three years, the targets set for social and health services for electronic services appear to be challenging to meet by 2020, since so many people experience big barriers in e-service use, alleviation of which would require substantial efforts not foreseen in the strategy.

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Fundamental change in Health professionals' tools

Jarmo Reponen, Professor

University of Oulu, Finland

Biography Jarmo Reponen



MD, PhD, radiologist, serves as a professor of Health Information Systems at the Faculty of Medicine, University of Oulu, Finland. He is past president of FSTeH and EuroPACS. He has more than 25 years of experience in the development, implementation and evaluation of hospital information systems, especially in the field of electronic patient record and radiology systems. His group co-developed the world's first mobile app for smartphones 20 years ago. Currently their research focuses on the effects of digitization in healthcare, with target areas of availability, use and usability of the information systems. Reponen is the responsible teacher for the special competence of information technology for physicians and eHealth introductory courses for medical students.

Background: The first wave of digitalization in health care supplied us with electronic medical records (EMR), digital image archives (PACS) and networks. In Finland and in other Nordic countries those tools have reached practically 100% availability already 10 years ago. This basic infrastructure is however not enough for performing successful eHealth. The national strategies in various countries emphasize citizen centered care but also capable tools for health care professionals (1). Today we are in the middle of the second wave of digitalization in health care which have given us more connectivity though national health exchanges (HIE), nationwide e-prescription and tools for interacting with patients and citizens. These are essential for health care reform with freedom of choice and patient mobility. The third wave of digitalization will add intelligence to the professional tools through e.g. machine learning (2) and it will empower the citizens. We can now follow this e-Health maturity in surveys also regionally and compare the maturity indexes.

Results: In Finland the status of digital transformation in health care concerning the availability, usage and usability of organizational and professional systems was last surveyed in 2017 within the STEPS 2.0 project consortium (3,4). The preliminary results show that there are still many different methods of patient information exchange between professionals and the national HIE is most useful for private service providers. Our systems are mostly lacking efficient tools for individual patient - physician communication. However, especially private service providers are developing mHealth consultancy services directed to citizens. All health care organizations have increased the amount of services provided through their web sites and today the patient is more informed than three years ago. The third wave of digitalization has improved the intelligence within the digital systems, e.g. speech recognition is used more than before and e.g. automated warnings of medicine interactions are now a commonplace. Decision support tools have become more integrated into the EMRs and care process management is taking its first steps.

Conclusions: Health information systems are entering the second and third wave digitalization, which will give the professionals more connectivity, more interactions with citizens and more intelligent tools. This requires a new generation of software but also awareness of the new roles of physicians and nurses. Citizens' own role in their health will increase with the new eHealth and mHealth tools.

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Nordic Countries: how eHealth revolutionized Health policies

Arild Faxvaag, Professor

University of Trondheim, Norway

Biography Arild Faxvaag



Arild Faxvaag, MD, PhD, is Professor in health informatics at the Faculty of medicine, Norwegian university of science and technology (NTNU) and consultant in rheumatology at Trondheim university hospital. He is a founding member of a multidisciplinary research group in biomedical informatics and an experience-based masters in health informatics. Since its inception, faculty from the research group have supervised around 25 PhD candidates and numerous master students. During 2015, he was a Visiting professor at Harvard medical school and Brigham & Women's hospital i Boston, USA wher he conducted research in health logistics, Clinical decision-support and mHealth. His research interests are: e-Health policy and evaluation of health information systems, Knowledge-based systems, mHealth and Patient-centered information systems.

Background: Laws, regulations, white papers and policies constitute the main instruments for shaping and improving the health systems in the Nordic countries. In 2011, the Nordic Council of Ministers established an e-Health group as a central forum for knowledge transfer and platform for a joint formulation of strategic e-Health initiatives. In 2012, the forum established collaboration with Network of Nordic e-Health researchers (NeRN) to develop indicators and collect indicator data for the e-Health policy area. As of 2018, the NeRN researcher network has conducted two policy analyses and indicator data gatherings. As any practice with important outcomes to many different stakeholders, the development of e-Health policies should be informed by knowledge. The specific objective of the NeRN work period is *“to support the development of knowledge-based eHealth policies in the Nordic countries by collecting, assessing, analysing, and sharing data to inform the outcomes of eHealth practices”*. Little is known about the effects of gathering and publishing e-Health indicator data on the subsequent development of of the e-health policies.

Objective: The objective of the presentation is to show how the current e-Health policies in the Nordic countries are influenced by achievements and evaluations of the past, and how the indicator development work in itself perhaps is shaping e-Health policy-making.

Data and intelligence from eHRs for health care improvement and innovation: Where do countries stand?

Jillian Oderkirk, Senior Economist and Policy Analyst

OECD Directorate for Employment, Labour and Social Affairs

Biography Jillian Oderkirk



Jillian Oderkirk is a Senior Health Economist in the Health Division of the Organisation for Economic Co-operation and Development (OECD) in Paris, France. Jillian studies OECD countries' progress in advancing national health information infrastructure including the development of electronic health record systems and the use of personal health data for health system performance monitoring and research. Jillian worked with a team to develop an OECD Recommendation on Health Data Governance. Prior to joining the OECD, Jillian had a long career with Statistics Canada in Ottawa, Canada and was the Director of the Health Analysis Division at Statistics Canada from 2006 to 2011. Jillian has a Master's Degree in economics from McMaster University, Hamilton, Canada.

All countries are investing in the development of electronic health records (eHRs), but only some countries are moving forward the possibility of data extraction for research, statistics and other secondary uses that benefit patients. This presentation shares the results of the 2016 OECD Health Care Quality Indicators Expert Group's study of 30 countries that explores the technical, operational and data governance factors that support countries in developing health information and research programmes from eHR systems. It describes the data quality challenges and how some countries are addressing them and provides examples of national statistical and research uses of eHR data. It identifies ten countries with high readiness that are moving forward world-class health information systems supporting health system quality, efficiency and performance; and who are creating a firm foundation for scientific research and discovery.

Session 3B: National and mobile eHealth (5 minute rapid presentations)

*Chair: Ass. Prof. Piotr Skarzynski,
University of Warsaw, Poland*

*Co-Chair: Co-chair Professor Anil Kumar Jha,
Department of Dermatology and Venereology, Nepal medical college teaching hospital*

Thursday 15th of March 2018

17:40 – 19:30

In order to help scientists strive for brevity and clarity in their communications, the organizers offer a new compact style of presentation at this International Meeting called "5 Minute Rapid" presentations".

MHealth Adoption Issues: Similarities and Differences between Patient and Health Personnel in the Developing world. A Systematic Review

Addotey-Delove Michael Nii-Addotey^{1,2}, Richard E. Scott^{1,3}, Maurice Mars¹

¹TeleHealth Department, University of KwaZulu-Natal, Durban, South Africa; ²Pentecost University College, Accra, Ghana.; ³NT Consulting – Global e-Health Inc., Calgary, Alberta, Canada; University of Calgary, Calgary, Alberta, Canada

Background: In many developing countries, there are inadequate health personnel, limited health facilities, poor road networks, poverty, etc., making it impossible for large section of the population to access quality health care. mHealth is believed to be the solution to the numerous healthcare challenges facing the developing world. The introduction of mHealth into the healthcare settings brings new challenges and opportunities to both the health personnel and patients who use the system.

Aim: To identify similarities and differences in factors affecting mHealth use among patients and health personnel in the developing world.

Methods: The PubMed and Scopus electronic databases were searched systematically on studies conducted in the developing world to identify factors affecting patients and health personnel use of mHealth. The search was performed in December 2017 for papers published between 2000 and 2017. Full-text electronic articles were then retrieved from online journals. The papers that met the criteria were 103 out of 1176 papers. Individual verification and reviews were done by the authors, and their findings were put together and later discussed based on exclusion and inclusion criteria

Results and discussion: The analysis of results followed an interpretive synthesis approach based on 9 main themes and 18 sub themes. The findings revealed some similarities in mHealth use issues affecting both patients and health personnel. They were multi-sectorial engagement, strong community participation, political commitment and funding, privacy and confidentiality, available infrastructure, training and motivation, mobile phone ownership, and user friendliness of device. There were however, few issues peculiar to each of the two groups. For Patients they were language barrier, and health worker's competence and willingness to use technology, while that of health personnel were adequate staffing, receiving technical support, and flexible communicable mode with patients .

Conclusions: The review highlights the issues affecting mHealth adopting in the developing world by patients and health personnel in the developing world. The authors hope that the findings will help shape policy on mHealth implementation and use in the developing world.

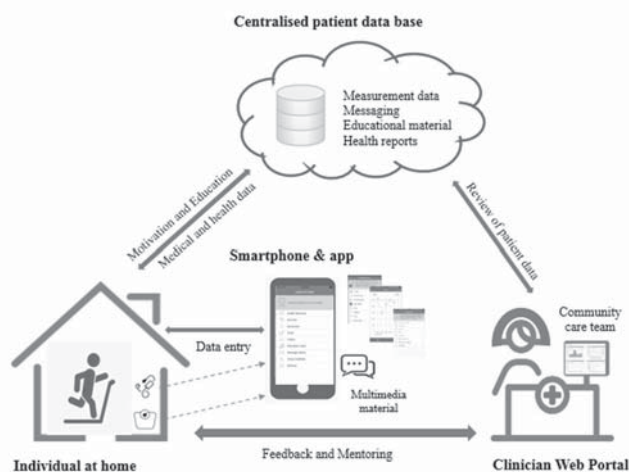
Keywords: mHealth, Telemedicine, Model, Framework, Health Personnel, Patients Developing World, E-Health.

HABBITualising mHealth

Marlien Varnfield¹, PhD; Christian Redd¹, PhD; Kevin Saric¹; John O'Dwyer¹; Mohan Karunanithi¹, PhD

¹Australian eHealth Research Centre (AEHRC), Commonwealth Scientific and Industrial Research Organisation

Background: The rapid development and uptake of mobile phone technologies is making a huge impact on the delivery of healthcare services. Smart phone applications (apps), online portals and many emerging ambulatory devices can connect patients to their providers and their personal health data to ensure high-quality, collaborative care. Scientists at AEHRC have developed an mHealth platform comprising of smartphone and Internet technologies, tailored to support self-management in a range of chronic conditions (outlined below).



MoTER: home-based cardiac rehabilitation care model being offered alongside traditional centre-based model, allowing for patient individual preference.

m-COPD: platform to integrate COPD (chronic obstructive pulmonary disease) guidelines to improve uptake of self-management by patients, and adherence to structured care management by clinicians.

PD-Buddy: remote care model to improve peritoneal dialysis service delivery through improvement in patient adherence, health outcomes and optimal staff utilisation.

MOTHER: support for women with first time diagnosis of gestational diabetes and improved multidisciplinary care co-ordination between their healthcare practitioners.

Motivation: The 'Health Assisting Bio-Bot Internet Technology (HABBIT)' concept was conceived as a means of encouraging greater treatment adherence by patients through extending the existing mHealth platform to produce real-world, observable outcomes in response to patient behaviour. HABBIT acts as a novel means of motivating patients, utilising advanced analytic approaches such as machine learning and artificial intelligence, to offer opportunities for better health outcomes. A literature review and consultation with experts were performed on how to best leverage contemporary research in gamification and motivational methods to encourage greater treatment adherence.

Results: From our findings, we have developed a tried-and-true gamification method, coupled with the development of an experimental real world, visually appealing, robotically-controlled bio system. This system is administered through a patient's smartphone and rewards them for treatment adherence according to goals that are set during consultation with their treating clinician, encouraging perseverance.



Given the enormous costs of non-adherence, efforts to employ novel techniques to encourage treatment adherence could result in cost benefits to healthcare providers and government, both in reduced lifetime healthcare costs and increased public engagement and productivity.

Experiences of chat-doctor services in private sector

Timo Carpén¹, MD, Päivi Metsäniemi¹, MD, Sari Riihijärvi¹, MD, PhD

¹*Suomen Terveystalo Oy, Helsinki, Finland*

Background and Purpose: Terveystalo is the largest private healthcare service provider in Finland. With its 170 units, 18 hospitals, 9000 healthcare professionals and 4 million annual visits, it provides nationwide network using one common electronic medical record. Terveystalo operates in two major business areas – occupational health care and outpatient clinics serving private customers. During the past decade no healthcare organization has pioneered the third wave of digitalization by making their services easily attainable everywhere via mobile apps or on-line services. At the same time, citizens have grown more comfortable using digital services for complex and sensitive issues such as healthcare. In addition, the authorities of Republic of Finland, such as Kela and Valvira have grown more supportive to digital services in healthcare. Our aim was to make our GP services easily achievable to everyone and everywhere in Finland via digital platform without the need of fixed appointments.

Materials and methods: Terveystalo Online chat was introduced in May 2016, first to occupational health customers. All private customers were included in October 2016. The platform used is provided by Ninchat supplying the highest data protection and data security standards defined by authorities. Patients are personally identified with high security system before chat conversation is started. In addition, the physician uses the Electronic Medical Record of Terveystalo. Usually the conversation is typed in a chat mode but when needed, a video connection is also available. Furthermore, attachments such as photos are possible. Physician can offer guidance, set diagnoses, and deliver information widely in issues regarding the patient's health issues. The physician can also direct patients to a physical examination in complex situations. The online physician is not allowed to prescribe strong painkillers, sleeping pills and other drugs affecting central nervous system.

Results: The number of customers has grown rapidly, and several hundred patients are treated daily through the chat service. The average waiting time is a few seconds. The average duration of a chat discussion is 8 minutes on average. The greatest demand for chat is on Mondays. The most common health issues are upper airway infections, urinary tract infections, skin problems, conjunctivitis and problems with musculoskeletal system. We have approximately 200 general practitioners in the chat service in order to supply the great demand daily. No major issues with patient safety have occurred.

Conclusions: Terveystalo Online chat is reliable, fast and user-friendly round-the-clock service. There was a clear customer demand for online doctor service and so far this service is the largest worldwide to our knowledge. Online chat is a modern way to supply medical services and a part of general work of doctors, especially of general practitioners. No relevant issues regarding to patient safety has occurred. Quality indicators, such as waiting time, prescribed medications, issued sick leaves and diagnoses must be constantly followed.

Leveraging Teletriage in an Urban Emergency Department to Improve Flow and Patient Experience

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Background: Overcrowding in Emergency Departments leads to increased waits and patients leaving without treatment, resulting in delayed care and a decrease in patient satisfaction. Some institutions have implemented a provider model to help improve on both patient satisfaction while improving upon publically reported metrics. The addition of these providers are costly but has shown to improve on those publicly reported metrics.

Jefferson University has implemented JeffConnect, their telemedicine platform which is used for both direct to consumer and for established patient video visit care. The On-Demand service is staffed 24/7/365 by EM physicians. Methodist hospital is an urban Emergency Department staffed by Jefferson physicians with approximately 40,000 visits a year. It consistently has not met its goals of Time to Provider of less than 18 minutes and Left Without Being Seen of less than 1%. Prior interventions to improve these metrics had included an Immediate bedding process, a physician incentive tied to bonuses for time to provider, staff engagement on the departmental goals.

Aim: In order to improve our metrics without increasing incremental costs, we leveraged use of JeffConnect and its On-Demand telemedicine physicians to tele-triage patients at Methodist Hospital.

Method: The On-Demand Telemedicine provider was setup to remotely triage patients over video during the hours of 11am - 6pm daily. Providers did a brief history and physical and placed appropriate orders. Our primary outcome to impact were the rates of patients that left without being seen (LWBS) and the door to provider time of patients during teletriage compared to other hours. These data were attained through the institutional EMR and was pulled using Qlic. The data was overviewed for redundancies and errors of categorization by the pilot team. Results were taken pre and post implementation.

Results: Rates of door to provider time and left without being seen (LWOBS) were compared from 7/1/15-6/30/16 to the time period 10/1/2017-11/30/2017. Previous year door to provider time was 26 minutes and LWOBS was 3.05%. During the period of teletriage of 10/10/2017 – 30/11/2017, the door to provider time dropped to 14.2 minutes overall and LWOBS 0.09%. It was also noted that the door to admission and discharge length of stay decreased by 15 minutes.

The study was a pilot and used already staffed physicians and the platform was provided at a low price so the additional costs were minimal. Telehealth staff were leveraged for training in the emergency department and could have led to indirect costs.

Conclusions: During the hours of Teletriage we saw a drop in both the rates of door to provider time and left without being seen. Although not part of original study, door to disposition time was also decreased. Teletriage shows promise as a useful tool to improve flow, provider and patient experience likely leading to improved health outcomes and satisfaction.

Using Technologies to Improve the Flow of Communication in Emergency Care

**Jari Haverinen¹, MSc; Maarit Kangas^{1,2}, PhD; Lasse Raatiniemi³, MD, PhD;
Iita Daavittila⁴, MD, PhD, Jarmo Reponen^{1,2}, MD, PhD; Minna Pikkarainen^{1,5,6}, PhD**

¹Research Unit of Medical Imaging, Physics and Technology (MIPT), University of Oulu; ²Medical Research Center Oulu, Oulu University Hospital and University of Oulu, Finland; ³Centre for pre-hospital emergency care, Oulu University hospital, Oulu, Finland; ⁴Oulu University Hospital; ⁵VTT, Technical Research Centre of Finland; ⁶Martti Ahtisaari Institute, Oulu Business School, University of Oulu

Background: Typically, many organizational stakeholders are involved in emergency care processes. Cooperation and fluent information exchange between several stakeholders like home care, emergency response center (ERC), rescue department, on-duty care and emergency medical services (EMS) is needed. This study was a part of the Wireless Lab Environment for Business (WILLE) project [1]. The first objective was to identify the current communication bottlenecks between emergency care professionals and understand the technologies behind them. The second objective was to describe the technologies, which can improve emergency care communication.

Methods: The information about current emergency care processes, technologies in use and the needs for future were collected from the emergency care professionals through workshops and personal interviews. The information about technological solutions for emergency care was collected from literature and interviews with companies.

Results: The key problem in the communication of emergency care is scattered data. Thus the common situation awareness for emergency care professionals is missing and the medical history of the patient is incomplete. There are many different information systems, which do not communicate with each other and there is lack of a common electronic Patient Care Record (ePCR). [2] National level projects called ERICA and KEJO will bring improvements to ERC and EMS information systems by offering more common situation awareness for authorities. With the introduction of KEJO, the ePCR will be adopted. If the consulting doctor has a KEJO terminal in use, there will not be any double recordings. The ePCR will be stored in the national Kanta Patient Data Repository, and all the documents, which are stored there, will be displayed to EMS personnel. [3] Scattered health data is a common problem in Finnish healthcare. For that reason, the UNA and Apotti projects have been set up to reform the main information systems of social and health care organizations. In addition to voice communication, there are needs for wireless broadband services for authorities like real-time vital signals and video transmissions as well as mobile use of electronic patient records (EPR). The VIRVE network used by the authorities has a limited ability to provide broadband services, therefore the solution could be using existing commercial networks alongside VIRVE or even using future commercial networks with private mobile radio network features. [2] Personal health measurements, sensors, telemedicine and analytics for healthcare will give opportunities to further improve the flow of communication in emergency care, provided those tools can be integrated into decision-making systems. An analytics solution should be a reliable instrument, which will assist professionals in decision-making and communication activities. There is an open issue who owns the measurement data that the citizens are producing: is it the citizen or is it the company, which offers cloud services?

Conclusions: Scattered health data is the biggest problem in the flow of communication in emergency care. The availability of ePCR to all stakeholders and the better integration of EPRs are the key issues to solve the communication problems. ERC and EMS systems will be improved with the introduction of the national projects ERICA and KEJO. Better information exchange between the information systems of social and health care organizations will be introduced with the UNA and Apotti project.

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Machine Learning Classification Can Identify Patients at Risk of Cardiovascular Event on Action to Control Cardiovascular Risk in Diabetes (ACCORD) Trial

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Background: High blood pressure increases risk of cardiovascular diseases (CVD). Recent studies have suggested blood pressure variability (BPV) is also associated with CVD; however, there is no standard risk stratification method to evaluate BPV.

Aim: Our study aims to cluster BPV into three levels, namely, low, medium and high levels, by a machine learning approach and assess the risk of CVD event based on BPV level.

Methods: The Action to Control Cardiovascular Risk in Diabetes (ACCORD) datasets, which include diabetes patients with hypertension or at risk of cardiovascular diseases, were obtained from a clinical data sharing platform. Participants with systolic blood pressure (SBP) of at least 130 mmHg and an increased cardiovascular risk were randomized to receive intensive treatment (targeting SBP below 120 mmHg) or standard treatment (targeting SBP below 140 mmHg), and blood pressure (BP) were measured and recorded during the follow-up periods. This study included patients with more than 6 visit-to-visit BP measurement in 24 months. BPV was measured by the deviation between the BP records and the personalized BP trends, and two-dimensional clustering on SBP and diastolic BP were applied. Linear regression fitting techniques and K-means clustering methods were applied. The risk of all-cause of death, CVD death, major coronary heart disease (CHD), nonfatal myocardial infarction (MI), stroke and congestive heart failure (CHF) were assessed regarding the BPV level and presented in terms of hazard ratio (HR) with 95% confidence interval (CI).

Results: With 4,104 patients, the mean age was 62.7 and 52.8% were male. There were 1,635, 1,819 and 650 patients classified into low, medium and high BPV. Compared with patients with low BPV, patients with medium BPV were more likely to have major CHD HR: 1.54 95% CI (1.24 to 1.92), nonfatal MI HR: 1.67 95% CI (1.23 to 2.26) and CHF HR: 1.91 95% CI (1.24 to 2.95). Patients with high BPV were at increased risk of all cause of death HR: 1.66 95% CI (1.13 to 2.45), CVD death HR: 1.92 95% CI (1.02 to 3.65), major CHD HR: 2.05 95% CI (1.58 – 2.67), nonfatal MI HR: 2.30 95% CI (1.61 to 3.28), stroke HR: 3.32 95% CI (1.80 to 6.12) and CHF HR: 4.62 95% CI (2.96 to 7.23) (Table 1).

Conclusions: Machine learning can be used for data clustering on BPV and is able to identify people at risk of cardiovascular event.

Table 1. Risk of Cardiovascular Event Compared with Patients with Low Blood Pressure Variation

BPV	All-cause of death		CVD death		Major CHD		Nonfatal MI		Stroke		CHF	
	n	HR (95% CI)	n	HR (95% CI)	n	HR (95% CI)	n	HR (95% CI)	n	HR (95% CI)	n	HR (95% CI)
Low	62	1 (Reference)	21	1 (Reference)	125	1 (Reference)	64	1 (Reference)	18	1 (Reference)	30	1 (Reference)
Medium	93	1.29 (0.93 – 1.78)	35	1.41 (0.82 – 2.43)	216	1.54 (1.24 – 1.92)	120	1.67 (1.23 – 2.26)	34	1.66 (0.94 – 2.94)	65	1.91 (1.24 – 2.95)
High	43	1.66 (1.13 – 2.45)	17	1.92 (1.02 – 3.65)	100	2.05 (1.58 – 2.67)	58	2.30 (1.61 – 3.28)	24	3.32 (1.80 – 6.12)	54	4.62 (2.96 – 7.23)

BPV: Blood Pressure Variation; CHD: coronary heart disease; CHF: congestive heart failure; CI: confidence interval; CVD: cardiovascular diseases; HR: hazard ratio; MI: myocardial infarction; n: number of subjects

Lessons from the American healthcare data breach records

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Background: American health institutions have a mandate to report breaches of protected health information (PHI) affecting more than 500 individuals. Some of this information is provided for public use through a breach portal [1], which includes records of over 2000 breaches in 2009-2017. A somewhat similar reporting requirement of personal data breaches, including identifiable health data, will come into effect in EU with the General Data Protection Regulation GDPR [2]. It will come to force 25 May 2018 and will require data controllers to report a breach of personal data within 72 hours to the supervisory authority [2].

Aim: Assess the typical types of data breaches and the trends over time. Evaluate potential improvements if a similar portal were to be implemented in the EU.

Methods: Data from both completed cases and cases under investigation was downloaded on 6.12.2017 and analyzed in Excel. Data from 2010 on was evaluated. When practical, data from 2013 was treated separately due to minor changes brought into the reporting process by the Health Insurance Portability and Accountability Act (HIPAA) omnibus final rule [3].

Results: The number of yearly breaches has increased from 199-278 in 2010-2013, to 327 in 2016 and 313 in 2017 so far. 70% of the reported breaches from 2013-2017 have been from healthcare providers. The total number of affected persons per year varied between 2,8-16,7 million, except in 2015, when three major hacking incidents brought up the total to 113 million. There was a slight upward trend in the number of breaches and, excluding 2015, also in the number of persons affected. Up to and including 2014 most loss of PHI was attributable to causes other than IT/hacking; since 2015 IT/hacking has been the leading breach classification. Breaches by unauthorized access/disclosure have also increased, with particular increase in disclosure through email. Breaches by theft have decreased. Information of the type of data lost (eg. billing information, social security numbers, passwords, medical history) is available through the portal only for some cases, and not in a structured form, and was not evaluated.

Conclusions: The breach tool is a valuable resource for evaluating the state of PHI security in the USA. Creating a similar tool in the EU would be beneficial. Open access to systematically gathered breach statistics could help focus counter-measures, to prevent subsequent incidents. Additional features that might make such tools more useful include listing both the primary type of breach and possible additional types; and listing the types of data lost. Structured follow-up data and structured updates of actions taken would also be useful for trend analysis. Increasing use of health-IT has increased the risk of major breaches, as seen in 2015. Apart from the three major incidents of 2015 the analyses show that there has been only a slight upward trend in the number and severity of incidents, the major change being in the type of breaches without a significant change in their numbers.

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Agile methods in developing a modern search tool for the physicians' clinical resource database

Jukkapekka Jousimaa¹, MD, PhD, Juha Kautto¹, MSc (Tech), Juuso Landgren¹, MBA

¹Duodecim Medical Publications Ltd.

Background: The EBM Guidelines (EBMG; in Finnish 'Lääkäriin käsikirja ja tietokannat') is a concise and easy-to-use collection of clinical guidelines for primary care, integrated with the best available evidence. The EBM Guidelines are continuously updated to follow the latest developments in clinical medicine and to bring evidence into practice. The collection is an essential point-of-care source of practical information to be applied in primary care. The pilot version was launched as early as in 1989 on a floppy disk. The first CD-ROM was published in 1991, and finally the internet-based EBMG database was published as a part of the Health Gate portal (in Finnish 'Terveystietä') by the year 2000. Several translated and localized versions have been developed in a number of countries since then. In 2017, more than 15 million articles were opened in the EBMG and the integrated auxiliary databases by the Finnish health care professionals. The use of these databases has become a standard in information-seeking for the majority of Finnish physicians.

What for is this project: Changes in the user interface must be carried out with extreme care so as not to confuse the busy clinicians. However, many technical solutions from the earlier years of the database are obviously becoming outdated, and their maintenance is time-consuming. Support for mobile devices is not at a satisfactory level. Thus, a project was launched in order to

1. enhance the usability and the user experience but at the same time preserve features that work well in the old version
2. improve the search engine to produce better matching hits faster
3. develop an interface that is completely mobile and tablet device compatible
4. better utilize the wide screen properties of displays while also maintaining compatibility with older screen
5. apply modern programming technologies (Angular 5 and NodeJS) to achieve better performance and less maintenance work
6. fine tune Visual Interface to provide better user experience.

This project is a collaboration with the EBMG editorial team, the Duodecim ICT department and the programmers from the companies Nitor and Roxeteer. User testing will be carried out by the company Eficode.

The agility principle applied in this project means that new pilot versions are launched at short intervals, even several times a day, for testing and commenting in order to speed up the development process.

Results: In this presentation, the improved EBMG program version with the new features will be presented. The importance of the agility principle in the development process, as well as the collection and utilization of pilot user feedback, will be discussed.

The availability and EMR integration of decision support systems in Finnish healthcare 2007-2017

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Background: Clinical decision support (CDS) systems assist healthcare professionals in clinical decision making-tasks. Potential for this assistance is one of the major clinical benefits of electronic medical records (EMR). Styles of decision support vary, from eg. the traditional marking of laboratory results outside the reference range, to automatic integration and offering local care protocols as the next step.

Aim: To evaluate the availability and integration of typical clinical decision support systems in Finnish healthcare.

Methods: The National eHealth availability survey was conducted in 2017 and targeted at Finnish hospital districts, primary healthcare units, and private healthcare providers. Responses on the questions regarding patient-oriented services were obtained from all 21 hospital districts, 121 out of 141 primary healthcare units, and a sample of 26 out of 46 approached private healthcare providers. A similar national survey has been used to assess the situation in 2007, 2011, and 2014 (Winblad et al. 2008, 2012; Reponen et al. 2015). In 2017 CDS systems were evaluated as three categories: Drug interaction systems; diagnosis support systems; and care pathway support systems. Four degrees of depth of integration with EMR were recognized: 1) External support system (eg. links to an external database on the computer desktop); 2) Navigation from the EMR system to a support system; 3) Graphics and reminders within the EMR (with no patient-specific suggestions); and, 4) Automatic integration of the EMR system and a knowledge database (including patient-specific suggestions). The deepest depth degree was used in subsequent analyses. Prior to 2017, the CDS categories for diagnosis support and care pathways were referred to by the names of typical Finnish services. This was changed to broader categories to account for the changing landscape and to allow for international comparisons. The results of 2011 and 2014 have been mapped to correspond to this system.

Results: In 2017 the availability of clinical decision support systems ranged from 50% (care path support in private healthcare) to 100% (drug interaction databases and diagnosis support in hospital districts). The availability of drug interaction databases has reached a saturation point in all hospital districts, and now an automatic integration for drug interaction CDS is used in 62% of hospitals. Historically the increase in availability and deepening integration has been steady in hospitals, from drug interaction CDS availability at 81% and automatic integration at 14% of the hospitals in 2007. In public primary care and in private healthcare the progress has been less stable. Care path support was the rarest type of CDS, and automatic integration for care path support was available in under 10% of the units. Both care path support and diagnostic support have also seen a steady rise in availability since 2011. All in all the prevalence of CDS systems was highest in hospitals and lowest in private healthcare.

Conclusions: In public healthcare organizations the uptake of clinical decision support systems has increased, and fully integrated systems are in common use. Further development is needed especially with regards to support for care pathways, and for integration into EMR systems used in private healthcare. The classification system produced logical results and could be used in assessment in other countries.

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Courses on telemedicine technologies of continuous medical education at RUDN-University

V.L. Stolyar¹, PhD, E.A. Lukianova¹, PhD

¹RUDN-University, Department of Medical Informatics and Telemedicine

Background: Telemedicine consultations have a number of advantages, including the possibility of obtaining a "second opinion" in the best world clinics for clarifying the diagnosis and determining the optimal tactics for treating. Updated Russian Federal Law No. 242-FZ of July 29, 2017 and normative acts of Russian Ministry of Health will create the necessary legal conditions for organizing and conducting consultations using telemedicine technologies. The available developments in telemedicine can be successfully applied to the teaching tasks of students in both medical and pharmaceutical fields. For several years, within the framework of the school on Telemedicine we studied what theoretical questions should be included into the curriculum, and what practical skills must be mastered first queue.

What for is this project: Telemedicine is actively being introduced into the doctors' practice, however, a basic knowledge of the possibilities and limitations of modern telemedicine technologies is needed, as well as practical skills in the preparation and conduct of video conferencing. In Medical Institute of RUDN-University, the conditions necessary for the implementation of continuous medical education (CME) - a simulation training center where physicians can improve their practical skills and the Telemedicine Center for video conferencing equipped with all modern ITU standards - have been created. Distance learning provides the opportunity to acquire new knowledge without interruption of working, it is convenient and flexible. Using videoconferencing for personification of interactive distance learning in CME, which will allow physicians to study at the workplace is perspective for distance learning development on the basis of modern telecommunication technologies.

Results: The educational module "Telemedicine" for students of 4-5 courses and two distant professional educational programs for physicians have been developed.

I) Educational module "Telemedicine" for students of 4-5 courses

The developed training module includes the following topics: The fundamentals of telemedicine, and the world trends in its development; Technological equipment of telemedicine events; Hardware and software of telemedicine; Economic and legal aspects of telemedicine; Scenarios of telemedicine activities such as: "Home telemedicine (monitoring and patient-doctor interaction)"; "Preparation, implementation and documentation of remote video conferencing (including cross-border)"; "Organization of remote mentoring during operations or diagnostic procedures"; "Organization of a remote interactive lectures from PFUR to the country of graduates". Students receive practical skills in the course of business games in preparation and conduct of video conferencing. We demonstrate to students the technologies of remote interactive learning (lectures and master classes from the leading clinics of Russia, countries of Europe, India, Brazil and Canada).

II) Distant program "Telemedicine Technologies in Healthcare Practice"

During this course basic concepts and definitions, goals and objectives of modern telemedicine are given. It tells about development of telemedicine. Successes and causes of damage of telemedicine projects are analyzed. The main forms of work in telemedicine: consultation, lecture, master class, scientific and practical conference, patronage, monitoring, supervising are considering. An idea about the Internet portal as an environment for organizing telemedicine events, as well as about the technical means of mobile telemedicine is given. The standards of encoding/decoding information as well as image and sound quality are considered in detail.

III) Distant program "Telemedicine in the health care system"

This program includes such special sections of telemedicine as tele-radiology and tele-cardiology, ethical and deontological aspects of telemedicine, the protection of personal data during telemedicine activities, remote access to the medical information system (MIS). Standards of storage and transfer of graphic information about patients are being studied. The principles of PACS (Picture Archiving and Communication System) have been given. Since pathomorphological examination is carried out at a distance using a video monitor instead of light microscope image, attention to the technological equipment for telepathology is paid. Students receive basic knowledge of the legal and economic relations of subjects in telemedicine.

The publication was prepared with the support of the "RUDN University Program 5-100"

Living Lab platforms in the City of Kuopio and Kuopio University Hospital

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¹Kuopio University Hospital, Living Lab project; ²City of Kuopio, Living Lab project

Background: The health and wellness industry has been growing steadily in recent years [1]. Investment in health and healthcare is recognised both nationally and internationally as an important focus of development. However, testing new health technologies in authentic healthcare environments has been difficult for companies, and new procedures are needed.

The City of Kuopio and Kuopio University Hospital (KUH) launched Living Lab to enable companies to develop products and services in an authentic healthcare environment. Living Lab is a project (2016–2018) funded by the European Regional Development Fund and the Regional Council of Pohjois-Savo. During the project, a process model and funding structure are being developed for Living Lab as a permanent service.

Aim and purpose: The aim of Living Lab is to facilitate customer-centric development of new innovative products and services utilising health and wellness technology. Collaboration between healthcare professionals and companies facilitates the development of customer-centric and patient-safe products and services. Living Lab also supports the innovation process for new ideas arising from healthcare personnel. Living Lab services are provided for a wide range of partners, from entrepreneurs and startups to large companies as well as research institutes.

The purpose is to develop a transparent process for companies to access authentic healthcare environments in order to assess the feasibility of new ideas, co-create and test new products as well as access clinical research. The process utilises the Quadruple Helix Open Innovation model [2], where the public sector, industry, academia and citizens work together to co-create future products and services.

The new process is being implemented through two Living Lab platforms, the City of Kuopio Living Lab and the KUH Living Lab. The City of Kuopio Living Lab focuses on primary social and health care, such as home care for the elderly, while the KUH Living Lab focuses on specialised care that enables clinical research.

Results: There were a total of 53 test and development processes in the two platforms up to October 2017, with a wide range of companies as clients. 79% of the companies were micro-enterprises with less than 10 employees, 58% were startups less than 5 years old, 48% were from the region of North Savo and 9% were international companies.

Based on our Living Lab survey, companies (n=35) are most interested in testing products and services (72%), co-creation in the development phase (63%), test runs (39%) and clinical research (30%). Companies can use the test results to further develop their products, devices and applications so that they will eventually put a patient-safe product on the market. Living Lab's best practices have been shared openly in the national Living Lab and TestBed collaboration network.

Conclusions: Companies have shown growing interest in Living Lab services and the capabilities of authentic testing platforms. Testing in an authentic environment and collaboration with healthcare professionals and patients provide companies with important information and knowledge during the R&D process. Living Lab services have become an integral part of the KuopioHealth open innovation ecosystem and collaboration with national, Nordic [3] and global living lab networks has begun.

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4. Nordic Infrastructure of Test Facilities, Nordic Innovation report, 2017

Results from University Hospitals as Innovation Platforms -project – YSI Co-creation model and Oulu University Hospital Innovation Process Pauliina Hyrkäs¹, BSc

¹Oulu University Hospital / Northern Ostrobothnia Hospital District

Background: The Finnish health innovation system has suffered from fragmentation. A consequence of this is that in Finland, unlike in many other countries, the related investments have not produced the expected added value. However, different stakeholders produce viable ideas every day that should be systematically used in the development of new products, services or working methods. Healthcare customers and professionals have essential knowledge about the development needs that should be utilized in co-creation of better and more efficient healthcare solutions.

What for is this project: University hospitals are at the core of their regional innovation ecosystems. Ideas emerging within the hospital that tackle a known issue should be refined and developed further, either within the organization itself or in co-operation with the companies, into new healthcare solutions, services or processes. A process that helps to facilitate co-operation between the companies, that develop these new solutions, and the end-users, either the professionals or the customers that provide the expertise, is needed.

YSI-project was executed as a part of the The Six City Strategy (6Aika), in collaboration with Oulu and Turku. University hospitals and universities of both cities were part of this project. In addition, Turku Science Park Oy was working as a coordinator. During the project, Turku built a process that helps to detect, evaluate and propagate requirements that emerge within the hospital, to companies that can develop these ideas further. Oulu's part in this project was to develop a process that could help companies, end-users or other stakeholders to co-create new healthcare products and services together (YSI Co-creation model).

Results: Oulu University Hospital and the actors of the innovation ecosystem received formal recommendations about the new policies for co-creating new products and/or services together with the companies (YSI Co-creation model) and also guidelines to organize the hospital's in-house innovation activity (OYS Development- and innovation process).

An observation was made, that the process made to drive innovation must be based on empowering co-operation between the stakeholders of the innovation network above all. The organization responsible of these activities has to be able to recognize the stakeholders, both internal and external, that might affect the operation of the process: different kinds of work cultures as well as different kinds of goals in the process. In addition, the organization responsible must create the means to communicate, that promote mutual understanding between the stakeholders. It is also important to detect possible collaborating partners, like companies and universities that are potential producers of added value in the process. Roles and responsibilities must be transparent between stakeholders. A process, that works efficiently, is built by taking everyone's needs and opinions into account within the innovation process and integrating them together while taking into account each stakeholder's rights and responsibilities.

During the project, the first version of the intended development- and innovation process was produced for Oulu university hospital. YSI-project's main result, company co-operation enabling YSI Co-creation model, has been included in the innovation process of the hospital. YSI-project lasted until the end of 2017. During the YSI-project, several other projects have already proceeded developing the innovation activity within the hospital. These projects include the Future Hospital OYS 2030 -programme, national Virtual Hospital 2.0 -project and international InDemand-project. The results gained from the YSI-project were utilized on local, national and international levels while the project was still executing.

Isaacus pre-production project: child protection process and placement decision

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Background: Health and wellbeing development of Finnish government is aiming at e.g. customer-responsive services and digital use of healthcare data [1]. An essential part of this development is data–analysis–knowledge management–communication chain, data and analytics being the key components of knowledge production and dissemination. Isaacus, a service operator that will provide wellbeing data and open data from different information sources and registers on a one stop-shop basis, will be a crucial element of the chain. Sitra-funded Isaacus pre-production projects [2] were aimed at preparing the national Isaacus service operator. City of Kuopio initiated an Isaacus pre-production project “Well-being information on children and young people”. During the pre-production, a data lake was developed to compile data that is scattered in various databases. The data includes the new social welfare and healthcare reporting system ‘service packages’ (nowadays called as ‘information packs’) information as well as client and guardian data. Remote-use platform for the data lake was tested and is being developed to support efficient secondary data use. [3]

Aim: To assess the social and child protective care process and predictors for resource use (placement decision).

Methods: The data consists of the family social services arranged by the city of Kuopio between 1st January 2013 – 31st August 2017 for individuals aged 0–17 years. The social care was complemented by health care data, and included key client and caretaker characteristics (e.g. number of guardians, number of dependants, family type). Generally, the Finnish family social services follow so-called RAD process: 1] request for inquiry, 2] assessment of need for support and 3] decision. Thus, and to maintain the track of process, we restricted the analysis to clients with at least one request for inquiry to the social or child protective services (the first inquiry in the data being the index event). Multivariate logistic regression modelling for the placement decision was done with Stata statistical software.

Results: 52.7% of the clients (total N 5554) were male, 83.8% of 5318 clients with residence information were Kuopio residents, and 4.2% of the clients had been taken into custody before the index event. At the time of index event, the clients were on average 8.7 (SD 5.3) years old. The number of siblings, who were also clients of the family social services, was on average 2.9 (SD 1.6; n 4030). 50.6% of the families with data (n 4083) were sole provider families. For the index event, the most typical reasons for inquiry included domestic violence/threat (15.5%) and intoxicant use by the parent (13.7%), and inquiries were frequently given by 17.9% police or 16.0% emergency centre. Common assessment types included social care need assessment and services, and open care need assessment, child protection and different types of placements. After the first inquiry, clients’ (n 4085) had an average 5.3 (SD 8.1) decisions. Robust, statistically significant multivariate predictors for child placement included inquiry reasons (child-parent disagreements, domestic violence or its threat) and initiators (emergency centre, child him/herself, social worker, family caretaker). The effect of some inquiry reasons (child’s violent behaviour, child being left without a guardian) and initiators (other social service provider, other health care service provider) was statistically volatile.

Conclusions: Child protection process was defined from the data and robust placement drivers were found. Isaacus together with Virtual Hospital 2.0 [4], Innovation village [5], and Self-Care and Digital Value Services (ODA [6]) are the key value drivers in the knowledge-based improvement of the quality and efficiency of Finnish care, and equality of citizens. Isaacus will hopefully enable the monitoring of quality of life, symptoms and lifestyle, and long-term illnesses.

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Indian Telemedicine Program from Concept to completion - Towards National Adaption

Prof.Satyamurthy. L.S¹, B.E.Electrical and Mechanical Engg, PG Electronics

¹*Suquino, Indian Space Research organization (ISRO), Telemedicine Society of India (TSI)*

Background: The Indian Telemedicine Program conceptualization, formulation and implementation was primarily spearheaded by the Indian Space Research Organization (ISRO) along with the support of some hospitals, dedicated Doctors, Technologists, state governments and Health Administrators. The Telemedicine being a technology based healthcare delivery system, the challenges for implementation and adaptation was a daunting task since the Health care system in India is primarily the domain of States Governments with federal government responsible only for national policies and funding.

Aim: To provide Telemedicine / e Health care service adopting the Telemedicine/ e-health technologies for the needy and underserved Rural and remote population of India for augmenting the existing health care delivery system in the country.

Method: The important factor of providing satellite connectivity without charge by ISRO was the harbinger which marshaled the diverse stake holders for the common cause of reaching out the unreached. ISRO along with Ministry Health, Government of India took the major initiative of addressing: Resistance to change to new system, lack of infrastructure, technology adaptation, connectivity/ bandwidth requirements, evolving National Standards for practice of Telemedicine, Creating awareness among Public- Doctors- Hospitals and Health administrators.

Result: India has now one of largest Telemedicine networks connecting various rural district hospitals in most of 25 States connected to several specialty / medical college hospitals located in major cities including several Mobile Telemedicine units. Formation of National Taskforce in by the federal Health ministry, Government of India recognizing Telemedicine as a National Health Mission has been major achievement including the National Tele-Oncology and Tele-ophthalmology networks. On an average more than 1000 Teleconsultation per day takes place in different medical specialties covering Government and private health care providers. Many State governments have been establishing the Telehealth networks separately. The Pan Africa Telemedicine network is another initiative of Government of India covering 50 countries in Africa connected to a group of Specialist hospitals and Medical Institutions in India.

Conclusion: More than one and half decades of telemedicine in India has resulted in the good understanding of the nuances of telemedicine/ e Health/ m health system encompassing the technologies, connectivity options apart from point of care diagnostics and Clinical protocols for providing Quality healthcare to Rural, semi rural and Remote population of India.

Session 4: Site visits

Friday 16th of March 2018

10:00 – 13:30

Site Visits

Site Visit Group 1: Swedish eHealth Frontrunners

- Swecare - Developing global partnerships in health for Swedish companies
- MedHelp - Nordic Careoperator with smart solutions in eHealth
- Visiba Care - eHealth platform that allows healthcare providers to open their own digital practice anywhere anytime
- Coala Life - Solutions enabling daily monitoring and analysis of your heart
- Psykologpartners - applied psychology and contextual behavioral sciences in the Nordic countries
- Nordic Health Living Lab

Site Visit Group 2: Future Care of Patients with Chronical Diseases

- RISE - Novel eHealth-solutions for the benefit of individuals and caregivers
- RISE - Hands-on demonstrations
- Cambio Healthcare – innovative e-healthcare solutions
- Sigma - solutions for the healthcare of tomorrow

Site Visit Group 3: Primary Care Center & eHealth

- Råsunda Primary Care Center – eHealth in practise
- Siemens Healthcare - Digital EcoSystem and eHealth vision 2025

Session 5A: Beating Cancer with the help of cyber community

*Chair: Chief Physician Päivi Metsäniemi,
Terveystalo, Finland*

Friday 16th of March 2018

14:00 – 16:00

5A-1 Being a patient in a cyber community

Minna Anttonen, Executive Director
Association of Cancer Patients in Finland

5A-2 New era for cancer support services with eHealth?

Satu Lipponen, Director of Strategy and Foresight
Cancer Society of Finland

5A-3 Collaboration and crowdsourcing - how oncologists work today?

Annelie Liljegren, Associated
Karolinska Institutet, Sweden

5A-4 Probabilistic Patient Modeling for Therapeutic Decision Support in Oncology

Jan Gaebel, PhD Researcher
University Leipzig, Germany

5A-5 Discussion: it's not the tools, it's the process. How to succeed in implementing digital service

Päivi Metsäniemi, Chief Physician, Medical Development
Terveystalo Oy, Finland

Being a patient in a cyber community

Minna Anttonen, Executive Director

Association of Cancer Patients in Finland

Biography Minna Anttonen



Creative and goal-oriented NGO professional with pedagogical and entrepreneurial background, holds Master Degree in Philosophy and is a qualified teacher, has also studied management and leadership. She has a spirit for new ideas and search for new outcomes in fundraising. Highly motivated for understanding needs in different phases of being a cancer patient and devoted to finding ways to reach cancer patients, also using modern technology and networks. Dedicated to patient advocacy. Anttonen started working as an executive director in Association of Cancer Patients in Finland about two years ago and has implemented two new projects that are based on and for the cyber-society that is formed by the cancer patients.

Aim: to enlighten how a patient organization in real world functions as a cyber community.

Methods: Conclusions due to 2 years unstructured observation, unscientific report.

The Association of Cancer Patients in Finland coordinates 18 cancer specific and 3 thematic patient networks in Facebook. The Association is also member or actively involved in more than 10 international patient organizations, such as the European Cancer Patient Coalition, Myeloma Patients Europe Network and Lymphoma Coalition. Communication between the organizations and among patients happens mainly in cyber community through Facebook, Slack, Twitter, Teamup as well as by email. The patient community is a global network of active citizens, local and cosmopolitan patient advocates and committed NGO professionals working for the patient organizations.

Cyber communities provide means for patients and their carers to seek support, learn about their illness and connect with others, but also to get increasingly involved in decision making in health care. Patients get empowered as their health literacy and self-efficacy are remarkably improved through support, information and advice. Patient organizations have active role in providing reliable information within the cyber community and acting as facilitators in between health care systems and patients, providing them opportunities to get more involved in actual decision making regarding their own treatment and HTA processes in general. This empowerment has led to increased quality of life and better treatment choices for individuals. It also allows patients to partner with doctors regarding national reimbursement protocols and decisions, which often limit both physicians' autonomy as well as patients' treatment options. However, the existing health care system has not yet realized full potential of global patient community and empowered local patients.

At the moment Association of Cancer Patients in Finland has developed two specific projects to meet patients needs online. Additionally, the Facebook group serves as an excellent tool to gather information through crowdsourcing when it comes to developing methods relevant for the target group. In the online platform, members can discuss challenges when it comes to different issues in their lives. Online worklife support project: Cancer survivors have a chance to network in a Facebook online community concerning job search, returning to work, managing with work and to other employment related issues. In order to make the project have more ownership with cancer survivors, the employees of have used Webropol questionnaires and open questions in the Facebook group to collect information on project activities and in order to improve the project according to wishes from the target group. Persons can additionally attend group meetings through Skype. Developing a website is in the pipeline. The aim is to incorporate secured ways to chat with an employee or with other cancer survivors in a group chat. There will also be a possibility to send a blog post anonymously through the website.

Online rehabilitation course: Cancer patients are offered a wide range of different kinds of rehabilitative courses but so far there have not been any completely web-based courses on offer. Based on the experiences gained from coordinating and facilitating the patient networks, a specific target group was chosen: cancer patients who have received an allogenic stem cell transplantation. The course will be carried out in the Spring of 2018 over the course of five weeks. Varied themes from coping strategies to returning to work will be discussed through a digital platform.

Results and Conclusions: Online patient organization in the future plays a vital role and this response should be met. In order to be fully prepared to meet future needs, patient organizations need to incorporate online resources into everyday actions and operations. This allows the patient community to be reached comprehensively.

New era for cancer support services with eHealth?

Satu Lipponen, Director of Strategy and Foresight

Cancer Society of Finland

Biography Satu Lipponen



Satu Lipponen is director of strategy and foresight at the Cancer Society of Finland, one of the biggest public health organizations in Finland. She has worked for cancer control, communications and health promotion since 1990s and before that as a journalist. Ms. Lipponen holds MSci from the University of Tampere. She is currently a board member of the International Cancer Information Service Group ICISG, a global NGO with 70 members.

Lipponen is active science journalist and has served as president for both Finnish and European wide science journalism associations.

Information and psychosocial support are increasingly important in beating cancer. Majority of cancer patients will survive in the future: in Finland projected five-year survival ratio is now 67% in men and 69% in women. Rehabilitation, lifestyle advices and low threshold services play a big role. Cancer as a chronic disease poses new challenges for patients, their families and service providers.

Offering quality information can help when coping with unwelcomed change. Recent studies of support services indicate that they empower patients. Cancer information service use can enhance confidence and competence to manage own health and get the most from the healthcare team. Cancer information and support nurses act as expert navigators, educators and compassionate communicators.

Different mobile and online services are well known among younger people. The variety of channels already available will affect future cancer support services. Cancer societies and other service providers are experimenting with new ways to reach patients, their families and friends in addition to traditional helpline services.

Technological advances will enable service providers reaching better coverage and more flexible support. Mobile applications, online chats and webinars, video conferences and social media platforms are in use. Virtual reality, online offices and artificial intelligence open new possibilities. In this presentation examples and lessons learned from different countries will be given. Cultural context in planning, providing and evaluating these services need to be recognized.

Collaboration and crowdsourcing - how oncologists work today?

Annelie Liljegren, Associated

Karolinska Institutet, Sweden

Biography Annelie Liljegren



Annelie Liljegren M.D., Ph.D. is Medical Adviser and Senior Consultant at Karolinska University Hospital, Project leader at Regional Cancer Centre Stockholm Gotland, Medical adviser/expert at The National Board of Health and Welfare. Previously she has been working in various positions, like Director of Oncology at Karolinska University Hospital, Medical adviser & project leader at the office of planning the New Karolinska at Karolinska University Hospital, Chief Medical Director at the New Karolinska (NKS), Medical Director of Residents of Oncology and Senior Consultant in Oncology.

Probabilistic Patient Modeling for Therapeutic Decision Support in Oncology

Jan Gaebel, PhD Researcher

University Leipzig, Germany

Biography Jan Gaebel



Jan Gaebel studied Computer Science at the Leipzig University, where he graduated in 2013 with his Master's degree in Medical Informatics. He joined ICCAS and the research group Digital Patient and Process Model (DPM) as a PhD-candidate in February 2014. Their main goal is to develop decision models for complex therapy decisions. Currently, Jan Gaebel and his peers are designing and validating a decision support system for the interdisciplinary therapy of laryngeal cancer. His research focus in particular is on quantifying and resolving uncertainty in clinical data.

A therapy decision support system (TDSS) based on Bayesian networks (BN) has the potential to support multidisciplinary teams in making patient-specific therapy decisions; mathematically substantiated, transparent and reproducible. BNs are used to model, simulate and study abstractions of real-life situations. At the project "Digital Patient- and Process Model" at ICCAS Leipzig, Germany, we aim at developing a BN based TDSS for laryngeal cancer.

The BN structure describes decision relevant variables and their direct causal dependencies based on conditional probabilities describing the influential strength from its direct causes. Patient-specific information can be set to a subset of variables, and an inferencing algorithm computes for each remaining variable the likelihood of its occurrence. Our model was developed and partially validated by an expert team using clinical guidelines and widely accepted studies. Within four years, we modelled a graph with over 1000 variables and more than 1300 dependencies including information entities about the primary tumor, lymph nodes, metastases, comorbidities, genetic factors, therapy options, therapy risks, and quality of life.

A BN has the potential to represent complex multidisciplinary therapy decisions. A key aspect in using BN for decision support is its transparent knowledge representation, which is suitable for collaborative decision making, as well as for selective model modifications. For example, subnetworks that are temporarily poorly substantiated or without probabilistic values (e.g., genetic factors and quality of life) can be adjusted and completed at a later time with a reasonable effort. Furthermore, new or updated examinations and therapies (e.g., focused ultrasound and pharmacogenetics) can be added, studied and compared to common therapies.

Discussion: it's not the tools, it's the process. How to succeed in implementing digital service

Päivi Metsäniemi, Chief Physician, Medical Development

Terveystalo Oy, Finland

Biography Päivi Metsäniemi



Päivi Metsäniemi, MD, is a specialist of public health medicine. For the last seven years, she has been working as a chief physician of medical development in Terveystalo, the largest private sector health care provider in Finland. She is enthusiastic about measuring outcomes of healthcare, developing the work processes, digital tools and working life of physicians and continuous development of patient safety. The digitalization of health care with all its benefits and challenges are the core of Päivi's own working life.

The session has several presentations, and it discusses and searches answers. The discussions are based on presentations in which the role of the patient and the health care professional is viewed from different angles. Often enough, digitalisation of healthcare has little to do with the technology itself and everything to do with how the processes are made more customer-centric, smooth, efficient and functional for everyone concerned.

How do organisations succeed in implementing digital services? When the patients' role changes – how do the professionals make best of it? How the care process changes, e.g. what kind of contents will be included to the physician's work in the oncology field? What do the patients expect from the health care professionals in 'cyber future'? Can oncology patient be as customer – and what does this mean in practice?

Session 5B: Tackling acute crisis in local and distant environments

*Chair: Dr. Claudia Bartz,
International Society for Telemedicine and eHealth, Telenursing*

Friday 16th of March 2018

14:00 – 16:00

- 5B-1 How to tackle acute health problems in space medicine**
Claudia Stern, Head of the DLR-Fligh Medicine Clinic
DLR-Institute of Aerospace Medicine, Germany
- 5B-2 New innovations in arranging emergency care and first visit**
Marja Ylilehto, Project Coordinator
Northern Ostrobothnia Hospital District, Finland
- 5B-3 Maritime emergency response services on Gulf of Finland**
Janne Sarkala, Lieutenant
Finnish Coast Guard, Gulf of Finland district Maritime Rescue Sub Center Helsinki
- 5B-4 Arctic conditions and acute health problems**
Tom Silfvast, Chief Medical Officer
Helsinki University Hospital, Finland
- 5B-5 Security of supply in the healthcare sector**
Riku Juhola, Special Advisor
National Emergency Supply Agency, Finland
- 5B-6 Technological Innovations in Latvian Emergency Medical Service**
Dita Heiberga, Chief Specialist
State Emergency Medical Service, Latvia

How to tackle acute health problems in space medicine

Claudia Stern, Head of the DLR-Fligh Medicine Clinic

DLR-Institute of Aerospace Medicine, Germany

Biography Claudia Stern



2015 – present, Lecturer at the Technical University Braunschweig Topic: Aerospace Medicine

2015 – present, Lecturer at the University of the Armed Forces Topic: Space Medicine

2015 – 2016, Interim Medical Director Institute of Aerospace Medicine

2016 – 2017, Project Leader for the psychological and medical selection of the private initiative “The German female astronaut” at DLR

Telemedicine is extremely important in remote areas that are far away and/or difficult to reach. One of these areas is the International Space Station which is only 400 km away from earth, but extremely elaborate to reach.

As astronauts live under microgravity conditions and in a hostile environment, keeping them healthy and fit is the most important aspect of space travel. To reach that goal and to gain more knowledge about the changes of the human body in microgravity, many medical and scientific examinations are performed before, during and after space flight. Astronauts are trained to conduct these examinations. During the missions the astronauts are supported by checklists and remote guiders. Each Sojus spacecraft has at least two astronauts on board that are trained as crew medical officers and are able to perform advanced life support, besides giving shots and stitching injuries. All European astronauts are supported by their individual flight surgeon who supports their mission from the training until the end of the recovery phase after landing. This also includes a weekly mandatory private medical conference with the astronaut.

In preparation of the travel to Mars ground based analogs are used to receive information and solutions for the main question: How to bring a human safely to Mars and back? These topics include mainly human physiology and behavioural science, as well as nutrition. Also the maintenance of the preflight acquired skills and providing the newest medical know how, working under radiation and reduced weightlessness and in dust, as well as the communication time delay of 20 minutes are the biggest challenges that we face on the way to Mars.

New innovations in arranging emergency care and first visit

Marja Ylilehto, Project Coordinator

Northern Ostrobothnia Hospital District, Finland

Biography Marja Ylilehto



Marja graduated as a Paramedic from the Oulu University of Applied Sciences in 2004 and currently works as a Project Coordinator in the national Virtual Hospital 2.0 project. She is responsible for coordinating the development of the Terveyskylä.fi (Health Village) digital health service and the planning and implementation of the related E-health services for emergency health care customers. Having worked as an Emergency Nurse since 2004, and as an Assistant Head Nurse during 2013-2017, Marja has previous experience in developing emergency health care services. Marja also holds a Master's degree in Health Promotion from 2012, and currently studies towards a Master's degree in Health Management Sciences at the University of Oulu.

Finland is a land of long distances where the coverage of existing health services and the population density varies considerably. New electronic health services are needed to reduce health disparities and improve the accessibility of public health services in Finland. With the Virtual Hospital 2.0 project, Oulu has had an opportunity to coordinate the development of e-health services for emergency department customers. Together with other university hospital districts we have formed a close team of experts whose work will reach customers and professionals when the virtual Emergency house opens at Terveyskylä.fi in February 2018.

The virtual Emergency house provides customers with reliable information and guidelines for sudden medical problems quickly, easily and in a simple mobile-readable form. The primary focus in developing the virtual Emergency house is to support the citizens' own decision-making and empowering them in taking responsibility for their own health. The new innovations that are brought to the attention of the emergency care customers are nationally operating digital tools for evaluating the need of emergency care and service management. Citizens today are getting more and more interested in looking for information regarding their health online. As developers of the virtual emergency house, we strive to ensure that citizens in need of information and medical help are guided toward reliable information sources and ultimately to the appropriate services.

The evaluation of need for emergency care and the development of service management require integration of call-centers and new digital services into a single service package, where guidance can be done cooperatively by combining different service channels. Service channels must support each other's activities and improve the quality of the guidance and the safety of the patient. This set of service channels will enable interactive communication between the customer and the healthcare professional in the future. Guidance and evaluation of need for emergency care can take advantage of digital solutions such as chat connections, different data transferring methods, and the use of artificial intelligence and machine learning at appropriate stages of the process.

It would be important to find tools for improving the customer service experience at busy emergency departments. Often the pain of the emergency care customer is increased by anxiety and uncertainty caused by lack of information. We have been actively considering how the information flow between the professional and the customer could be improved in an emergency department setting, and how to make the information related to the emergency care service and the status of the customers' own received care more transparent. The solution could be a mobile application linked to a patient record system that would allow personal, real-time status information to be shared with the customer. An application connected to the patient record system could send and receive information and guide the customer's activities during the emergency department visit in a new unprecedented way. By using a mobile application the time spent in the emergency department could be shifted from passive waiting time to active participation in one's own care. Professionals in Oulu are already using their own mobile application, HOITU, which enables them to read and update patient information on the electronic patient system in real time. The ultimate goal is to give patients the same possibility of following the progress of their care in real time.

Maritime emergency response services on Gulf of Finland

Janne Sarkala, Lieutenant

Finnish Coast Guard, Gulf of Finland district Maritime Rescue Sub Center Helsinki

Biography Janne Sarkala

Lieutenant Janne Sarkala has been on duty on all Coast Guard stations from Hanko to Kotka. Some experience also from Helsinki Vantaa airport border control and investigation units. Last few years mainly been in maritime Frontex (European Border and Coast Guard Agency) operations and in coordinating maritime rescue operation in the Finnish archipelago

The Finnish cooperation between authorities is brought into legislation. Different authorities have the means to act on the others duties. They are simply all funded by the government so there are no financial exchanges between each other when they act on behalf of the other authority.

The maritime emergency service in Finland is based on the legislation on Maritime search and rescue and agreement between the Finnish Border Guard and the health care regions. The agreements vary a lot between the health care regions on different parts of the Finnish archipelago.

The health care regions provide the coast guard search and rescue units (SRU) equipment, medicine and training for the missions. There are at least two training session a year for every SRU and resupply of medicine and new equipment are bought and trained for the SRU's by the hospital regions.

On the Gulf of Finland the organizing and acting in search and rescue (SAR) is the responsibility of Finnish Coast Guard. There is a Maritime Rescue Sub Coordination Center (MRSC) located in Helsinki that leads the SAR operations on its responsibility area on the Gulf of Finland, from Hanko to the eastern border.

On a normal emergency mission the units on land are coordinated by L4, the emergency's field coordinator. When the mission is brought to the sea area the cooperation between MRSC and L4 is critical for the succession of the task at hand.

Here are few examples of different situations in the sea and archipelago on the Gulf of Finland and the way it is handled by the Finnish authorities.

1. An emergency situation on an Island

- The mission is happening on land, but the emergency doesn't have means of transport. The emergency call center (112) will alert L4, MRSC, SRUs and ambulance.
- L4 is coordinating and MRSC will provide support

2. An emergency situation on a cruise Ferry (Telemedical assistance)

- The Ferry will call to MRSC and ask to provide medical assistance by telephone. MRSC will connect the Ferry to the doctor services on land.
- If needed the MRSC will provide an evacuation for the patient to land by boat or HELLO. If ambulance is needed MRSC will contact L4 for support.

3. An emergency on a pleasure yacht.

- MRSC will coordinate the operation; L4 will provide support and assistance. MRSC alerts ambulance via L4 to shore to meet the SRU, or MRSC will order a HELLO to evacuate the patient straight to the hospital.

Main key to success is the seamless cooperation between MRSC and L4 in coordination of the mission and the cooperation of SRU's and emergency units in the common goal of saving lives at sea and in the archipelago.

Arctic conditions and acute health problems

Tom Silfvast, Chief Medical Officer

Helsinki University Hospital, Finland

Biography Tom Silfvast



Short biography: After specialization in anaesthesiology at the Helsinki university hospital he subspecialized in intensive care medicine and worked as senior consultant at the intensive care unit of Meilahti hospital until 2001. He also has a 30-year long working history as a physician in the ground and helicopter emergency medical service systems in Southern Finland and is currently their coordinating medical director.

Maintaining homeostasis of body temperature and metabolism in a cold environment is a stress especially to the cardiovascular system. This may provoke acute worsening of preexisting diseases, but exposure to cold may also directly cause severe medical harm and even be life-threatening. The presentation will briefly review basic physiology and health risks in cold environment and focus on rescue challenges and treatment strategies relating to acute health problems in arctic conditions.

Security of supply in the healthcare sector

Riku Juhola, Special Advisor

National Emergency Supply Agency, Finland

Biography Riku Juhola



Riku Juhola is working as a Special Adviser, National Emergency Supply Agency (NESA), Health care sector - Contingency planning and logistics.

The objective of security of supply is to secure the economic functions and technical systems necessary for the population's wellbeing, the country's economy and national defense in the event of serious disruptions and emergencies. Critical infrastructure services include energy transmission and distribution networks, electronic information and communication systems, financial services, transport logistics systems, water supply, construction and maintenance of the infrastructure and waste management. Critical production areas and services include food supply, vital industry and finally health care and social services.

Threats to security of supply have evolved from those of the Cold War to terrorism, general uncertainty and conflicts. Globalization and the network economy, digitalization and cyber threats have changed the focus of contingency planning. The most serious external threat is a crisis situation temporarily impeding the country's ability to produce or import critical products and services. Other major threats include disruptions to data communication systems and networks, interruptions to energy supply, serious disruptions to public health, natural disasters and environmental accidents.

Several methods are used to ensure security of supply. These include, for example, generally proactive actions like substitute arrangements, public-private partnership (PPP) and emergency stockpiling. The resilience toolkit is based on information, cooperation, regulation, ownership, as well as financial and operational instruments. International cooperation is also important. This mainly entails in Europe cooperation with the European Union, but there are also other multi- and bilateral agreements supporting security of supply.

Critical companies and organizations take cyber threats into account in their continuity management and uphold a sufficient level of protection against such threats. A disruption in one part of a critical data system should not cause the entire system to malfunction. Critical systems must be secured also in a situation where international data communication connections are not in use or their functioning is severely compromised. The most critical information assets must be duplicated nationally.

The foundations of security of supply are as follows: a competitive business sector, a functional society and a well-educated and informed population.

Technological Innovations in Latvian Emergency Medical Service

Dita Heiberga, Chief Specialist

State Emergency Medical Service, Latvia

Biography Dita Heiberga



She holds a Bachelor's degree in Public Health and Master's degree in Health Sciences. She is a Senior Specialist at Department of Disaster Medicine Preparedness Planning and Coordination. One of her main responsibilities is prepare emergency preparedness plans and procedures for disasters and large-scale emergencies. She has worked as a lecturer at University of Latvia and still continues read lectures at The Red Cross Medical College of Latvia. She has experience working in eHealth related projects. Latest of which aims to develop a new innovative model for the prevention of lifestyle-related diseases.

Emergency Medical Service providers are an essential component of the country's healthcare system. In Latvia State Emergency Medical Service of Latvia provides prehospital emergency medical care. Even more, since 2009 State Emergency Medical Service (SEMS) is the only provider of pre-hospital emergency medical care in Latvia. The transition from a decentralized emergency medical service (39 municipal prehospital EMC providers) to a unified emergency medical service (only one provider – SEMS) required significant changes in the management system and establishment of adequate and modern infrastructure and information technologies.

Main functions of SEMS is to organize and provide pre-hospital EMC; to organize training in emergency medicine, first aid and disaster medicine; and to plan disaster medical system, organize and provide EMC in emergencies and provide support for hospitals.

Session 6: Collaborating innovations

*Chair: President Andy Fischer,
International Society for Telemedicine and eHealth*

Friday 16th of March 2018

16:30 – 18:20

6-1 European Living Labs

Tuija Hirvikoski, Director

Laurea University of Applied Sciences, Finland

6-2 eHealth2018 Game Jam results

Games for Health Finland

**6-3 International Society for Telemedicine and eHealth,
Presidential Service Award**

Andy Fischer, President

International Society for Telemedicine and eHealth

European Living Labs

Tuija Hirvikoski, Director

Laurea University of Applied Sciences, Finland

Biography Tuija Hirvikoski



Dr. Tuija Hirvikoski has been the elected ENoLL President since 2017. ENoLL is a global network of open innovation ecosystems (Living Lab). The network of Living Labs places people at the centre of innovation and societal development. Moreover, based on Open Science and Open Innovation principles the Living Labs facilitate collaboration among researchers, local public authorities, citizens and companies for better or new solutions. The network provides innovation services for small and medium-sized international companies, the public sector, research organisations and individual citizens. Hirvikoski works as a director at Laurea University of Applied Sciences with 20 years of experience on open innovation development. Laurea has been a pioneer in the development of open innovation methods and the utilisation of Living Labs. Open innovation, collaborative development and piloting have been a fixed part of Laurea's Learning by Developing (LbD) model. Hirvikoski is also member of the European Commission's Open Science Policy Platform. Her mission is to support the complementary interaction between Open Innovation, Open Science and Open Learning. For her merits, in 2016 she received the Innovation Luminary Award for the best Open Innovation Infrastructure Creation (EC OISPG). Hirvikoski holds a PhD in Industrial Management (Innovation and Innovation Ecosystems), MSc in Physical Education and MSc in Administration.

European Network of Living Labs integrates research and market-based development in a holistic manner by facilitating eHealth stakeholders' collaboration both in local and transnational innovation ecosystems (Open Science Open Innovation). Moreover, Living Labs support companies to shorten the time from design to market by piloting, validating and demonstrating their eHealth solutions either in Europe or in other continents. In open Living Labs we perceive our clients and end-users as real partners and actors, not as research factors, this way we have bigger change to facilitate also health related behavioural transition.

eHealth2018 Game Jam results Games for Health Finland

Games for Health is emerging field that promotes well-being, health and functional capacity. These games have desired health outcomes and are used to encourage citizens to take responsibility for their own self-care. There is a huge amount of applications, technology and games that can be used as such or tailored to inspire and motivate different user groups to achieve health benefits. Games for Health Finland and is bringing together a unique combination of expertise, innovation and cross-cutting know-how for the benefit of people's well-being.

Gamification gives us clear goals, proper challenges, interaction and rules for engagement, motivation, participation and inspiration for better life management. Simply put, gamification is about applying certain game-design elements and game principles in a non-game context. It offers users to perform activity that is completely immersed in a feeling of energized focus and enjoyment. Gamification can also improve individual's ability to comprehend digital content.

The Health care sector should be seen as a living lab, a platform, where new, open, agile and user-friendly services are brought to life with a twist of gamification to engage the users. Health Game Jam offers new prototypes and solutions for health promotion, disease prevention and sustainable healthcare systems. eHealth2018 Game Jam focuses on Patient Safety.

eHealth2018 Game Jam is organized by Games for Health Finland and will be held as a part of eHealth2018 conference. Game Jam brings together healthcare professionals and game makers to create new ideas and ways to use technology and promote gamified eHealth solutions.

eHealth2018 Game Jam results (created in 28,5 hours) will be demonstrated in this session.

To be honest... time to make the actual game is less than 20,5 hours (Game Jam site is closed for the night). Also some of the jammers suffer from motion sickness and normally jammers can't manage without internet, but in the boat they have to. Jammers also consume enormous amounts of energy drinks during the event and that does not improve concentration. So if you want to see the harsh reality of making games in extreme conditions and challenge them even more into desperation, come and share you ideas and visions! You can find us from eHealth2018 Game Jam area.

Inspite of extreme time limit and other discomforts, we are sure that we can dazzle you with our results, but are you ready to see them. Seeing them can cause inspiration, happiness, innovations, relaxations and nirvana. If you think you can handle these positive symptoms, you are welcome to hear the results (later maybe even test them yourself)!

Equation of eHealth2018 Game Jam:

$(20 \text{ people} * 20 \text{ hours}) / (\text{energy drink} + \text{no internet} + \text{motion sickness} + \text{party}) + \text{co-creation} = x \text{ demos for patient safety} + \text{excitement} + \text{flow}$

International Society for Telemedicine and eHealth, Presidential Service Award

Andy Fischer, President

International Society for Telemedicine and eHealth

Biography Andy Fischer



Andy Fischer studied medicine before graduating in specialist studies in surgery and emergency medicine and was a physician in the Swiss emergency helicopter service (REGA) until 2006. In 1999 Andy Fischer founded Medgate and has led the entire Medgate group since then as CEO. Andy Fischer is a founding and executive member of the Swiss Society for Telemedicine and eHealth (SGTMeH) as well as President of the International Society for Telemedicine and eHealth (ISfTeH). He has been lecturing in Telemedicine at the University of Zurich since 2008.

Andy Fischer will summarize the conference based on what he has experienced.

He will also give the Presidential Service Award, in recognition of outstanding service rendered to the International Society for Telemedicine and eHealth (ISfTeH). Award is for Ms Claudia Bartz, PhD, RN (USA), who has worked tirelessly as Chair of the Telenursing Working Group and served as liaison with the ICN for the cause of improving modern nursing worldwide, through the use of Telemedicine and eHealth. She has actively shared knowledge and research outcomes related to Telenursing and eHealth.

POSTERS

P-1: A project for implementation of information system for diagnosis of the burnout syndrome

Rumyana Stoyanova¹, PhD; Stanislava Harizanova², MD, PhD; Rositsa Dimova¹, MD, PhD

¹Department of Health Management and Health Economics, Faculty of Public Health, Medical University of Plovdiv, Bulgaria; ² Department of Hygiene and Ecomedicine, Faculty of Public Health, Medical University of Plovdiv, Bulgaria

Background: Burnout is a phenomenon that seems to be studied globally in relation to all types of populations. The methods available at present only register the irreversible changes that have already set in the functioning of the individual. A notable advantage of Boyko's standardized method for burnout assessment allows clinicians to detect possible susceptibility to burnout and to use individual approach in the psychological prophylaxis.

What for is this project: The aim of the project is to create an information system to evaluate the burnout syndrome based on Boyko's inventory in order to better both assess and manage burnout.

The information system will be design on the basis of Boyko methodology. Boyko developed an 84-item questionnaire distinguishing three phases in the syndrome each manifestable with four symptoms. Each item in its positive or negative variant carries a different number of points, which allows the formation of a total score for each of the symptoms. The clarity and uniformity of interpretation of the scales makes this inventory easier for clinicians to compare the obtained results with other psychodiagnostic techniques and it allows that the advantage of ICT being used. In Bulgaria, so far, there is no information system implemented for diagnosis of burnout. As a result, we initiate that project.

Results:

Expected results are:

- Designing a model to develop an information system for assessing and analysing of burnout.
- Reducing the burnout rates among employees through accurate and quick diagnosis.
- Improving the prevention using the information systems' capabilities.
- Lowering medical care expenses.
- Promoting exchange of successful problem solving and decision-making patterns between health care providers.

The expected results confirm the necessity to create and put into operation an information system in order to better evaluate and manage burnout.

P-2: A review of gamification in the improvement of oral health knowledge

Mariño R¹, CD/MPH/PhD; Wassouf H¹; Wen W¹; Wen MJ¹; Whyte RJ¹; Vuckovic K¹; Manton D¹, BDS/ MDS/PhD; Black J¹, MD/PhD; Meredith G², BcompSc/BScIT; Stranieri A², PhD

¹Melbourne Dental School, University of Melbourne, ²Federation University

Aim: This study was undertaken with the purpose of systematically reviewing Apps containing gaming elements to improve oral health knowledge and to assess their embedded behavioural change techniques.

Methods: A systematic search was conducted using four major electronic databases to search for papers investigating educational games research applied to oral health and the ability to improve oral health knowledge in children and adults. This review included papers published between January 2000 and June 2017. The Critical Appraisal Skills Programme criteria were used to assess the relevance and results of each published paper in this literature review.

Results: 296 records were found in the initial search. After title and abstract screening, and elimination by full text review, seven articles fitting the criteria were identified. Both interactive dental video games and non-video games were as effective as traditional, non-interactive educational methods in improving oral health knowledge in selected children and adult populations. Nonetheless, participants' feedback reflected a higher level of satisfaction in learning through games. The quality of the studies was limited due to small samples, limited age range of participants, length of follow-up periods to review knowledge retention, and poor follow-up attendance.

Conclusions: Educational games are used scarcely in the promotion of oral health, and little reliable data is available to confirm their efficacy. Most studies involved children. While gamification has been successful, further studies are required using more rigorous designs, evaluation and follow-up. Additionally, because of differing learning styles, more studies involving adult are recommended to identify effective gamification strategies.

P-3: A structured review of factors for successful patient–provider mHealth project scale up in Africa

Addotey-Delove Michael Nii-Addotey^{1,2}; Richard E. Scott^{1,3}; Maurice Mars¹

¹TeleHealth Department, University of KwaZulu-Natal, Durban, South Africa; ²Pentecost University College, Accra, Ghana

Background: Hundreds of mHealth projects have emerged over the years in Africa intended to improve the quality of healthcare and extend service delivery to underserved communities. However, many of these projects do not get scaled up beyond the pilot stage due to a number of factors. Identifying these factors is key to ensuring success in adoption, service delivery, sustainability, and eventual scale up.

Aim: To identify factors necessary for scale-up of mHealth projects for patient-provider communication.

Method: PubMed and Scopus databases were searched in December 2017 to identify studies reporting issues affecting patients or health workers use of mHealth in Africa and which either promoted or impeded scale-up. The search found 316 studies published in English between 2000 and 2017. Of these, 90 met the inclusion criteria after the retrieval of full text papers.

Results and discussion: Included papers were categorized into three groups of patient and provider mHealth use: health providers alone (n = 50), patients alone (n = 28), and both patients and providers (n=12). The methods used in these papers were quantitative (n= 46), qualitative (n = 37), and mixed methods (n= 7). The papers were grouped as follows, consultation and data collection (n =30), HIV/AIDS adherence and management (n = 24), phone use among health workers (n=12), maternal and postnatal issues (n= 10), adherence to malaria treatment guidelines (n=6), TB adherence and management (n = 5), and mHealth for learning (n= 3). The dominant factors identified after analysis and synthesis of common themes were, inter- and intra-organizational capability that supports the exchange, regulatory compliance, and affordability and ownership of phones.

Conclusions: These finding will inform future successful mHealth implementations in Africa.

P-4: Client's self evaluation as a basis of professional support

**Sakari Kainulainen¹, PhD; Arto Holopainen², MSc (Tech);
Maiju Tirri², Public Health Nurse; Katriina Kankkunen², MHSc,
Heidi Laakko², Master of Social Services**

¹Diaconia University of Applied Sciences; ²City of Kuopio, Social and Health

Background: In Finland, social and health centers, hospitals, private companies and organizations provide public services. Their activities are governed by various regulations. Organizations use different information technology systems in their operations management and customer service. In addition to organizational diversity, the services provided are influenced by many professions and their working cultures. The multidisciplinary service system and multiprofessional work combined with non-integrated information systems pose many challenges for practical work. The ongoing reform of the public social and health services aims to clarify the situation and the high expectations of digitalisation.

It has been shown that a small part of the population uses most of the services. The result must be understood; most of us have a specific problem and we want the service to help. When there is fever, we get medicine and salute. The process is clear, easy to organize and affordable to produce. Often, however, the needs are more complex or those that do not have direct service from the service system. People who need many services at the same time make a challenge to the service system. The city of Kuopio, as a pioneer in the ODA project launched by the Finnish Government, applies a self-assessment methodology for the life situation of a school child and their parents and a right-time access to early childhood support.

Aim and Purpose: The aim of the experiment is to test the usefulness of 3X10D Survey in practical work. 3X10D Surveys is a tool for self-assessment of life situations applied to schoolchildren and their parents. Self-assessment is made holistically for all of the key areas of life. In this case, the customer's own needs will be displayed before the start of a face-to-face service process. During the spring of 2018, the extent to which digitally pre-filled self-esteem could be used to facilitate the identification of needs and the better targeting of experts' work.

Methods: The experiment is based on a 3X10D self-assessment measure developed for the 16-29 age group [1,2]. Original measure was further elaborated measures for schoolchildren and their parents. The measure estimates the typical life domains of each age (or family). The defendant evaluates the life domains in a 11-step scale, whose extremities are "very dissatisfied" and "very satisfied". The wording of the extremes of the ranges varies from self-assessments to under 14 years by questions. In addition, there is a self-assessment of oral health due to a multidisciplinary experiment. There are three schools in Kuopio, where multi-professional student care is available. This also makes it possible, if necessary, to arrange multi-professional meetings when it is necessary because of self-assessment or other reasons. An online 3X10D Surveys is sent to children and their parents before the annual health check-up. The child and the parents send the self-assessments to the nurse to see before the meeting. The nurse is preparing to discuss in particular the areas of life where satisfaction ratings are low.

Results: Our hypothesis is that electronic self-assessment promotes multi-professional collaboration when looking at the customer's needs globally and does not break into too complex entities. Likewise, we assume that the customer's pre-information can be more quickly processed to the needs of his support.

Conclusions: If the results show the self-evaluation of meeting school health care to bring benefits to the client process and provide faster assistance to children and families, the method would greatly enhance the right-timing delivery of support for schoolchildren and the functionality of the service system.

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P-5: Comparison of the frequency of positive hearing screening outcomes in school-age children from different countries in Africa – telemedicine model

**Ass. Prof. Dr. Piotr Henryk Skarżyński Piotr Henryk^{1,2,3}, MD, PhD, MSc;
Maciej Ludwikowski¹, MSc, MBA; Weronika Świerniak¹, MSc;
Prof. Henryk Skarżyński¹, MD, PhD, dr. h.c. multi**

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³Institute of Sensory Organs, Warsaw/Kajetany, Poland

Background: Hearing screening have an extremely important preventive task, being the primary means of secondary prevention. They allow for an early detection of hearing disorders, thus enabling treatment and eliminating or minimizing the negative consequences associated with this type of dysfunction. Hearing-impaired children often experience delayed development of speech, language and cognitive skills, which may result in slow learning and difficulty progressing in school. For many years the Institute of Physiology and Pathology of Hearing has undertaken a variety of initiatives in countries across continents, which include screening for hearing.

Aim: The primary goal of the program is early detection of hearing impairment, especially in children who start school and at raising awareness among parents and the school environment about hearing problems. These efforts are aimed at improving the state of medicine abroad, especially in African countries, enabling access to health care and promoting healthy lifestyle.

Methods: Hearing screening was performed in group of 1713 children in 8 African countries: Cameroon – 260 children, Congo – 210 children, Ghana – 170 children, Ivory Coast – 132 children, Nigeria – 340 children, Rwanda – 183 children, Senegal – 206 children, Tanzania – 212 children. Screening was performed using the Sensory Organs Platform; based on an audiometric hearing threshold measurement procedure. A modern platform developed by the Institute of Sensory Organs is essential for the affordable and universal study of a large population of children. The threshold values for air conduction were determined in the frequency range of 0.5 - 8 kHz. The abnormal test result was the threshold value for air conduction of 25dB HL and more for at least one frequency in at least one ear. Moreover, a subjective assessment was conducted on the basis of questionnaires for parents. In addition in some countries the protocol of study was extended with OAE and video-otoscopy.

Results: An abnormal screening result was found in 18% to 34% of the children tested. Most of the hearing loss was benign or moderate, most often among all ears with abnormal hearing screening in children with high frequency hearing loss. In addition, there was a large number of unilateral hearing loss. In most cases, parents were not aware that their children had hearing problems. Studies have shown that the scale of hearing impairment among school children is significant in all countries participating in the program.

Conclusions: Pilot hearing screening has shown that the organizational model of screening developed in Poland and the methods, devices and information systems used in the studies can be successfully implemented not only in European countries, but also in African countries. It should be emphasized that hearing screening performed outside of Poland was the first hearing screening test conducted in schools in the surveyed countries.

The results confirm the high incidence of hearing problems in school children. Based on the results, it is strongly recommended to implement hearing screening in the countries concerned as a routine procedure in medical care.

P-6: Comprehensive approach to the National Network of Teleaudiology in Word Hearing Center in Kajetany, Poland

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Background: Treatment of hearing impairments nowadays makes use of the numerous state-of-the-art technologies, such as hearing aids and various auditory implants, allowing hard-of-hearing and deaf people functioning in the word of sounds and communicating with others. These modern treatment methods usually entail complicated set-up, regulation and adjustment procedures requiring frequent consultations with an experienced specialist with access to dedicated equipment, usually available in specialist centers and hospitals. The treatment results are to a high degree dependent on the good organization of the medical care and rehabilitation. Patients' visits in the specialist center often entail long trips from their domicile; they invest their time, sometimes take a full-day leave from work, and cover the cost of travel, which for many families may be a problem. Additionally, patients, particularly children and persons with collateral mental disorders, after the long travel are tired, irritated and unwilling to cooperate with the specialist. To remedy these problems and improve the quality of patient care, the Institute of Physiology and Pathology of Hearing (IFPS) developed and implemented into the clinical practice the National Network of Teleaudiology, a specialized network allowing the use of the internet and modern IT tools to provide medical care, rehabilitation and technical support for patients visiting a subsidiary or one of the affiliated polyclinics of the Institute.

What for is this project: After success in Poland we started cooperation with different centers in another continents. Such example is Odessa in Ukraine where there is cooperation with Black Sea Center of Hearing and Speech "Medincus". Currently, NNT consists of 21 cooperating centers in Poland and 4 abroad in the Ukraine (Odessa and Lutsk), Belarus (Brest) and Kyrgyzstan (Bishkek). There is possibility to diagnose patients with complicated ear diseases with videotoscopy and objective hearing assessment (for example ABR). In Bishkek Kyrgyzstan there were first telefitting between World Hearing Center as well as ABR assessment. In another countries there was hearing screening in children performed with automated database analysis. Coded date was sent and there was feedback information to centers which took part in research. Such project was realized in Tajikistan and Kyrgyzstan. In Africa there are in progress another project connected with screening and assessment (Senegal and Nigeria). In addition, the WHC is equipped with integrated system for audio and video recording. All telemedical connections used in everyday medical/clinical practice, such as telerehabilitation, telefitting, teleconsultations, are registered in a central database. All surgical procedures can be registered and archived in a central surgical register. The whole video network works in Full HD resolution that ensures the picture of high definition and quality. The system allows to transmit live surgeries to any room in the Center. This creates outstanding educational possibilities, trainees can watch transmission on computer and projection screens. Thanks to this state-of-the-art video conference system we have a capability to connect with centers all over the world and realize live transmissions from operating and conference rooms.

Results: As a sum up we claim that telemedicine is very good way of support for less experienced centers where during such consultations there is high possibility for education of local specialists.

P-7: Consumer Perspectives and the Development of Standards for Telehealth Services

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Telehealth services come within the wider reference frame of ‘digital health’. They are defined by the Telehealth Quality Group (www.telehealth.global) as ‘the means by which technologies and related services concerned with health and well-being are accessed by people or provided for them irrespective of their location’. What is significant about this definition is that it regards telehealth services neither in technological nor in purely clinical terms. Instead it sees telehealth services as ‘accessed by’ as much as ‘provided for’ the people who use them. It signals a move from a mindset that regards service users as ‘patients’ or dependents to one that recognises a constituency including consumers able to exercise choices and control over the services they use. Finally, the definition, by reference to ‘well-being’, positions telehealth services at least partly in the arena of public and preventative health and is, therefore, concerned as much with behaviours and lifestyles (of people of all ages) as with acute health events or the treatment and management of long-term conditions (disproportionately experienced by older people).

Developments in telehealth are, however, very rapid. Technological changes (notably exhibited in the form of mobile devices, video-communications and wearable sensors) are revolutionising our thinking about, not only how we access health-related services, but about how we can take more control over our health. Older, technology-based (or driven) services that are narrowly configured according to management needs of service provider organisations (be they local authorities or health trusts) can, therefore, be increasingly seen as unlikely to meet the changing aspirations and needs of tomorrow’s service users. Small wonder that new rafts of services, mostly in the private sector, are emerging to meet some such needs – with their foci extending from tele-psychiatry to medication reminders.

This paper notes a range of standards, quality marks and codes of practice that relate to telehealth services. These extend from those that are more prescriptive (often top-down and technology-driven) about service operation; to a few that offer a consumer-driven perspective (concerned with choices and options). It is argued that the changing mindset for telehealth must relate to a mainly consumer rather than service provider (or technology) perspective. Following from this, it is suggested, a clear contribution can be by standards for telehealth services where people (and ‘patients’) can be empowered and for whom at least the preconditions will be more in place for them to maintain healthier lifestyles and behaviours.

Attendees will be guided in an exploration of the impact of technological changes on the way people access services relating to their health and well-being and gain insights into the world of standards and their growing role in the field of health and well-being services.

P-8: Culture of Experimentation in Promoting the Development and Introduction of Digital Social and Health Care Services

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Background: The rapidly evolving technology enables the digitalisation of social and health care services. The challenges in the use of digitalisation still include the insufficient implementation of the required changes in work processes and the lack of knowledge on the use of digital services and on the experiments already carried out. The culture of experimentation implemented in multidisciplinary cooperation can contribute to the introduction of new services enabled by digitalisation for citizens and for social and health care organisations. The DigiSote projects of North Karelia and Northern Savonia (ESR) are working together to promote and develop the digitisation of social and health care services and to solve the related challenges. The projects aim at developing, evaluating and deploying new digital services through quick digital experiments. The duration of the experiments varies from one day to 100 days. The experiments also help to develop the digital competence of the different parties and enable the emerge of new innovations. Authentic project cooperation and network cooperation between the several local actors helps to support the success of the experiments and solve the challenges that have emerged. The projects are implemented by Karelia University of Applied Sciences and Savonia University of Applied Sciences, Savo Consortium for Education, the Municipality of Lapinlahti, and Siun Sote (Joint Municipal Health Care and Social Services Consortium in North Karelia).

Learning through experimenting - from challenges to solutions: It is typical for quick experiments that the planning phase of the experiments is light and, if necessary, the mode of implementation may be changed as the experiment progresses. It has been challenging to perceive what the actual goal of the experiment is. The starting point for a digital solution experiment is the need that has been discovered when analysing the current state. The assumption is that the product or service to be tested will benefit the customer and the organisation. We have discovered that customers' service processes have not always been described from a customer's point of view. In the projects, we have developed tools to help those involved in the experiments perceive both the current and the targeted customer process, to discover problems that could be partially solved with the use of digital tools, and to plan, implement and evaluate the experiment process. Organisations do not necessarily have the required technology, and that is why the project-led experiments have tried to maximise the use of technology already in use. Modification of the technology in use can result in new, creative solutions. An open dialogue between the technology provider, the social and health care organisation, and the participants in the experiment can ensure that the plan and the objectives of the experiment are appropriate. On the other hand, social and health care organisation should allow start-up companies in the field of technology to come and test as well as develop their products in an authentic environment together with the users. Multidisciplinary cooperation in experimenting digital services can be fruitful, but it requires respectful and equal attitudes of the parties towards each other.

Customer attitudes, lack of interest, and fears are examples of factors that have been preventing the successful implementation of the experiments. These challenges have been addressed through information distribution and by listening and developing the digital competence. Enabling customers' digital participation has been considered significant and therefore, customers have been engaged in the planning of the experiment from the very beginning and they have, thus, been able to develop one's individual digital competence. Furthermore, the attitudes, fears, competence, and lack of competence of employees are factors that hinder the deployment of digital services. Continuous development of the employees' digital competence, motivation and support are the tools for meeting the challenges of digitalisation and they inspire people to start using these services and tools.

DigiSote project / North Karelia: www.karelia.fi/digisote

P-9: Developing an algorithm to detect falls in the Electronic Health record: a diagnostic accuracy study

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Background: Fall events are among the most common adverse events and are linked to undesired outcomes, such as prolonged hospitalization, disability or even death. To reduce falls, it is essential to accurately measure them. Currently used methods (e.g. voluntary incident reporting) suffer from underreporting. Fall detection algorithms for electronic health records (EHRs) may facilitate the task in an efficient and cost effective way.

Aim: The objectives were: 1) to develop an algorithm to identify fall events in the EHRs of a Swiss University Hospital; and 2) to determine the diagnostic accuracy of the algorithm using voluntary incident reporting and the Global Trigger Tool (GTT).

Method: This retrospective study included a sample of 120 randomly selected patients in a general internal medicine department over 6 months. The algorithm was developed using structured query language (SQL) and text mining approaches. Sensitivity, specificity and predictive values were compared to falls identified with the GTT and voluntary incident reporting.

Results: The patients' mean age and length of stay were 70 years and 14.6 days, respectively. The algorithm identified 11 fall events, whereas two events were missing in the GTT and seven were missing in the incident reporting.

Conclusion: The newly developed algorithm produced higher sensitivity and precision than GTT and voluntary incident reporting. Further evaluation with a larger sample are needed, with the goal of using it in real-time to monitor fall events in the whole hospital.

P-10: Digital Care Plan Makes the Patients Health Goals Achievable

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Background: Care plan is a fundamental tool in healthcare. Traditionally, it conveys information between healthcare professionals (HCPs). There is growing evidence on its usefulness also between HCP and patient, since it makes the patient an active subject on his/her own care (1). It is of major importance that it takes the patients goals into account, thus empowering the patient.

The Finnish national authorities have included the care plan as a part of healthcare legislation. Every patient with a long term health condition should have an up-to-date care plan. In occupational health care, a health and work ability plan is a legal prerequisite (2).

In the era of digitalization, an ideal care plan should be transparent, interactive, easily modified, supportive, efficient and safe.

What for is this project: We developed and implemented an early version of a digital care plan that focuses on the patient's own health goals. The focus population consisted of Terveystalo's 670 000 occupational healthcare users. Of this population, approximately 20% come to health check-ups to an occupational health nurse every year.

In the care plan (Own plan, Oma suunnitelma in finnish), the patient chooses which health issues she/he is ready to concentrate in, and together with the occupational health nurse chooses the relevant actions by which to achieve the goals. The plan is generated to Terveystalo's patient portal, Oma Terveys, and can be followed both by all healthcare professionals concerned with the customer's treatment and the customer herself. The care plan combines information from various data sources: health check-up questionnaire, patient portal, and the EMR. The plan then sends reminders to the patients and allows both the patient and the professional to see how well the goals are achieved. In this work, we primarily look at the first phase of the digital care plan, its implementation and continuous improvement process, and factors leading to its usage or neglecting it from the HCP's point of view.

Results: Since the implementation in august 2016, some 73 000 care plans have been made. The majority of health goals are related to weight loss and exercising more, wellbeing at work and managing pain, lowering cholesterol or blood pressure and smoking cessation. We now know that occupational health nurses are able to do a digital health plan during the health check-up. We have also identified reasons that prevent making the plan: primarily not having the time and not knowing how to set the goals with the patient. We are focusing on user experience both on the HCP and the patient end in order to achieve continuous use of the plan, and we want to show how continuous improvement of user experience is achieved in this project. In next phases, we will be able to analyze the effectiveness of the new process of health check-ups.

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P-11: Digital testing platform enables agile social welfare and healthcare trials

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Background: User-centered development of products related to social welfare, healthcare and medical technology and services requires an infrastructure that encourages innovation. It is essential for the companies developing new solutions for the healthcare industry, that a connection between the users is present at all times during the innovation and testing processes. Also healthcare professionals working in the public sector, who come up with new innovative ideas that incorporate digital aspects, need support in order to assist them to bring new ideas to practice. In addition, the Future Hospital of 2030 renovation project is going to incorporate the newest technologies available. In order to test these new solutions, Oulu University Hospital needs a sophisticated space and processes necessary to test these solutions efficiently.

Objectives: To fulfill these needs, test environments are necessary to test new technology and services emerging in social welfare, basic healthcare, and specialized healthcare sectors. The aim for this project is to create a digital testing platform that is able to replicate a similar realistic infrastructure that the production side of the hospital has in place. The digital testing platform provides possibilities for the companies to test their solutions in an agile way, without the restrictions set by the legislation or other national audit requirements.

Results: With the digital testing platform, it has been demonstrated that combining and displaying information from arbitrary patient health record systems (PHR) is possible. Related to this, integration between three major PHR systems present in Finland was developed. The integration gathered patients' risk, diagnostics, and medicinal information. This information was able to be shown in an aggregated view. This aggregated view enabled the clinician to view important information related to the patient in an easily readable and coherent way.

In addition, an implementation has been developed that makes it possible to tap into the data streams that many eHealth devices e.g. sensors and other IoT devices provide. These information streams can be imported from the sensor manufacturer's cloud services into the existing test PHR systems available in the digital platform in real-time. Real-time data exchange means the healthcare professionals are able to see an up-to-date view of the patient's physiological measurement data at all times. This data includes for example information about the patient's body temperature, body weight and blood pressure readings. Recent implementations include a sensor that is able to transmit data about the pain level of an infant child.

The digital integration platform has proven to be very effective in developing various proof-of-concept level designs. As an indirect result, the digital testing platform has evolved to provide a large variety of information systems due to successful company co-operation. Assimilating new technologies into the digital testing platform enables even more diverse and complex integrations between hospital information systems, e-health appliances, and other mobile devices.

P-12: Evaluating eHealth interventions: Results and experiences from the pilot of an ICT-based self-management tool for Heart Failure patients in Norway

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Background: As the number of eHealth tools increase and their use is getting more and more popular, the development and implementation of good evaluation methods for these tools becomes very important. The fast pace of technological development, the economic interests, the societal needs and several other factors push towards shorter alternatives to traditional evaluation approaches. In this climate, it can be challenging to balance the quality requirements of good scientific conduct. The Norwegian Center for E-health Research, in collaboration with partners from Israel and Switzerland has been engaged in the evaluation of the pilot of the SENACA ICT-based self-management tool for chronic diseases developed in Switzerland by European Medical Network AG.

Aim: The aim of our study was to evaluate the effect and the user-acceptance of the tool, by developing and implementing the appropriate evaluation method. A secondary aim of this study was to reflect on the fitness of the methodological choices we made and to share our experiences.

Methods: We recruited 12 patients with Heart Failure living in Northern Norway. We collected data through questionnaires at baseline, at day 50 and at day 100 after baseline. We have also collected daily data regarding weight, blood pressure and activity. We analysed the data with non-parametric methods, such as Friedman test.

Results: The median age of the users was 61 (IQR 57.5, 69.5). There was no statistically significant difference between the difference time points in weight (Chi-Square=3.11, df=3, p=0.428), activity in steps (Chi-Square=6.7, df=3, p=0.084), diastolic blood pressure (Chi-Square=2.5, df=3, p=0.475) or systolic blood pressure (Chi-Square=6.528, df=3, p=0.089). User acceptance was generally positive at both timepoints (day 50 and day 100) and did not change significantly (Chi-Square=0.4, df=1, p=0.754). The evaluation method proved to be adequate for providing information regarding the feasibility of the tool, but the small sample as expected limited the potential for generalizations.

Conclusions: The evaluated tool was safe and seemed to deliver the expected functionality, helping patients to maintain weight, and level of physical activity over time. Users also seemed to be satisfied with the tool. Our evaluation method served its purpose and can be reapplied in the evaluation of other pilots of similar tools.

P-13: Exploring the Multiple Uses of Video Conferencing in Child Psychiatry

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Background: Transnational eHealth Services for Child and Adolescent Psychiatry (eCAP) project was launched in October 2015 for improving the quality and availability of child and adolescent mental health services in sparsely populated Northern peripheral areas, , the focus has been on developing a *video conferencing (VC) service for remote child psychiatric consultations*, allowing the primary healthcare professionals in scattered municipalities to flexibly consult the specialists of the Department of Child Psychiatry at the Kuopio University Hospital (KUH). The objective is to support early detection of mental health problems of children (under 14 years) as well as to contribute to timely intervention and treatment close to the natural developmental environments of children, irrespective of geographical distance to child psychiatric specialist healthcare. The developed VC service consists of an online booking system and a VC solution provided by Istekki Ltd. Since January 2017 over 225 primary healthcare professionals have received training and materials about how to use the service, and webcams and loudspeakers have been installed to over 110 workstations to facilitate the VCs. However, in the 12-month period the demand for video consultations has been low, and new uses of VC in child psychiatry have been innovated.

Aim: In January – September 2018 different child psychiatric services based on VC will be offered free of charge to primary healthcare professionals working with children in the Pohjois-Savo region. The aim is to explore the different ways how VC can be used in child psychiatry for supporting primary healthcare workers in early detection, timely intervention and appropriate treatment of mental health problems of children.

Methods: For assessing the feasibility of the offered services, data are being collected in multiple ways. In order to find out the opinions and experiences of the target groups about the provided training and materials, an electronic survey was administered in December 2017 – January 2018. After the actual VC meetings, the participants are asked to fill in an electronic feedback form with questions about the aim, topic, technical quality and overall satisfaction with the VC. In addition, short telephone interviews are conducted with those primary healthcare professionals who received VC equipment for their use. Finally, closer to the end of the project, some non-users will be contacted by phone for inquiring the reasons for not utilizing the services.

Results: The respondents of the survey (n=89, response rate 44,7 %) considered the provided training and materials sufficient (75 % agreed, 22 % partly). No one had used the service after the training, yet they were still positive about the VC: 36 % of the respondents said that they *will use* and 53 % *might use* the service in the future. Also the gathered feedback after the meetings (n=9) demonstrates favorable attitudes towards VC in child psychiatric consultations and clinical supervision: all respondents said they could do the VC again. According to most respondents, it was convenient to talk in the VC and the goal of the meeting was reached well, despite in some cases there had been problems with the video connection (33 %). In the telephone interviews most interviewees said they were satisfied with the provided training, but there just had not been a need for a child psychiatric video consultation. Many also acknowledged a certain psychological barrier to start using a new method. In contrast, the offered opportunity of clinical supervision in VC was eagerly welcome by many interviewees, and the tutored virtual peer groups have also aroused interest.

Conclusions: As the project is still ongoing, it is too early to draw conclusions, but already our preliminary results suggest that video conferencing may be a useful tool for child psychiatric specialist healthcare to support primary healthcare in managing locally the mental health problems of children (as postulated by the ongoing social and healthcare reform in Finland). However, more experience and further investigations are needed to judge whether VC is most suitable for consultations, clinical supervision, joint patient appointments or some other form of collaboration and information exchange between primary and specialist healthcare. Moreover, the feasibility of different approaches may vary between municipalities, professions and roles of health workers.

P-14: Finnish special competence for healthcare information technology

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Background: Healthcare information and communication technology has become an everyday companion for medical doctors and dentists and it serves as a strategic tool for change. In Finland, the current availability of electronic medical record systems is 100% both in public and private care (1). Telemedicine and eHealth solutions are an inheritant part of digital transformation. They extend from professional consultation services to mHealth and self care solutions targeted to citizens (2). During the forthcoming Finnish social and health care reform digitalization is playing a major role, and the expected outcomes are related to the success of digital services. However, the education process of medical doctors and dentists has not been well prepared to these needs.

Therefore, in 2012 Finland was to our knowledge the first country in Europe to establish a special competence for healthcare information technology to physicians and since 2015 to dentists, too. The vision is that medical doctors and dentists could use their clinical expertise in the development of healthcare information and communication technology as well as eHealth and mHealth solutions (3). The experienced network of experts could then collaborate with enterprises, research institutes and other actors in the field. The formalized special competence is providing a motivating professional career path to the individuals, too.

Methods: In order to qualify for the special competence program, one has to become first a qualified medical specialist consultant. A five years experience in clinical work without specialization is enough for dentists (and in exceptional cases for physicists, if one has proven special achievements in related areas). Anyhow, a minimum of five years clinical experience is needed after a licenciate degree. The special competence requires then cumulatively two years practical service and theoretical studies. The practical service in the information technology domain can consist of e.g. developmental, educational or research duties. One can also serve in an enterprise or make own research. According to rules, the duties should be versatile, it is not enough to work with only one information system. The theoretical studies are collected from courses in universities and universities of applied sciences, from eHealth conferences and seminars. It is mandatory to participate international eHealth events.

There are no formal exams, but the applicants have to fill a competence portfolio under a supervision of their mentor. Two external reviewers then give their opinions. After reading those opinions, the special competence committee organized by the Finnish Society of Telemedicine and eHealth makes its recommendation and the final degree of special competence is given by the Finnish Medical Association or the Finnish Dental Association, respectively. (4)

Results: In January 2018 already 106 doctors and dentists have been enrolled to the program. Seven of them are dentists and 99 physicians. Of those enrolled, 64 physicians and seven dentists have achieved the full competence. Those still in process have received guidance for their studies from the special competence committee. Those graduated have found positions as leading healthcare information technology experts or in administrative tasks in regional or national health information technology projects.

Conclusions: This new special competence gives already graduated doctors and dentists an ability to utilize their knowledge about healthcare processes for the benefit of the new eHealth and mHealth services. However, it is necessary to bring these skills in the future as a module to the basic medical education. Therefore University of Oulu has since 2016 produced a piloting eHealth course for medical students (5).

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P-15: Feasibility of a web-based, lifestyle intervention in patients with liver disease, cystic fibrosis, esophageal cancer, or psychiatric disorders
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Background: Regular physical activity is generally recommended to healthy people, but also improves the clinical picture of different diseases. In order to increase the physical fitness or to delay the disease related symptoms, medical societies recommend up to 150 minutes of aerobic endurance training of moderate intensity. Additional strength training should be performed two times a week. However, lack of interest or loss of motivation are common barriers for many people to achieve these guidelines. If a web-based solution is an effective and motivating method for delivering tailored exercise recommendations to patients in their home environment, is the objective of this article.

Aim: Our objective was to gain new insights in different user behaviors of our web-based interventional concept (expressed as login rate and login duration) and to assess the physical activity level (expressed as minutes per week) in patients with liver disease, cystic fibrosis, esophageal cancer, or psychiatric disorders.

Methods: Four clinical trials were carried out (iPEP study: internet-based perioperative exercise program; HELP study: hepatic inflammation and physical performance in patients with NASH; EXDEP study: exercise in depression; COMMED study: cystic fibrosis online mentoring for microbiome, exercise & diet). All patients were monitored and supported over the same platform and received tailored recommendations and activity goals in weekly intervals. The study participants had full access to the content of the homepage, including a discussion forum for peer support.

Results: Five patients of each clinical trial (20 patients in total) were compared in terms of their using behavior and their physical activity level over eight weeks. There was a significant decrease in the using behavior across all studies (login rate $P < .001$; duration $P < .001$). However, focusing on the single trials, there was a significant decrease only in two studies (HELP study ($P = .004$; $P = .002$); iPEP study ($P = .021$; $P = .001$)) and no significant change in the other two investigations (EXDEP study ($P = .583$; $P = .378$); COMMED study ($P = .867$; $P = .558$)). Physical activity levels did not change across all studies over the eight weeks ($P = .311$). However, in the HELP study, the physical activity level increased steadily over the period analyzed ($P = .045$).

Conclusions: Exercise manuals and video tutorials could be downloaded from the website. This aspect could at least partly explain the decrease in the using behavior. With the help of the developed program/platform, it was easily possible to integrate the exercise program into the patients' daily routine and to provide a flexible and individual support in time.

P-16: Improving nursing methods of work by using protocols in intensive care units

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Since 1950 intensive treatment has become a separate and independent specialty. The significant technological advances have allowed intensive care units to be monitored through the centralized work of a multidisciplinary team of specialists. Intensive units have been provided cares at different levels of support for intensive patients. To provide patient access to this highly specialized cares, the "Critical care without walls" or "Intensive Care without Borders" theory has been emerged, which is part of the idea of reanimation nurses offering highly specialized cares and support. The development of protocols for the work of nurses, aims to facilitate their day-to-day activities, improving the outcomes and safety of patients and all staff. Following this concept, the role of intensive cares has been rapidly expanded over the last 20 years. The performance of nurses, as an integral part of multidisciplinary teams in ICUs, is evidence that mortality and morbidity can be prevented, thanks to the early recognition of patient' deterioration and rapid resuscitation.

The main objective of this study is to analyse and differentiate the main reasons for the limited use of protocols in intensive care units in university hospitals in Plovdiv, Bulgaria. It is important to assess the activities carried out by the nurses, who do not have experience working in ICUs. We wanted to study their effectiveness and all the benefits for the organization of working process. Have been used documentary and survey methods, data has been analysed by using the software package SPSS v. 17.0 and graphics have been prepared by using the program Microsoft Excel '97.

After this survey, we can say that usage of protocols in ICUs, requires constantly evolving staff, which has to be supported by the physician. Better healing process is accomplished by optimizing the content, using new technologies and techniques, also periodically evaluation of the desired results. We should have developed more flexible framework, which has been accepted by standard, which will improve the quality of cares. Educational programs must be improved and their effect should be studied. There are concerns, that the lack of nurses in ICUs in Bulgaria has been seriously increased.

P-17: India Tele Emergencies in the Himalayas : a 31 month study from Apollo Telehealth Services

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Aim: Non availability of emergency health care services in mountainous isolated, sparsely populated regions is a universal problem. Commencing from April 2015 Tele Emergency Services (TES) was provided in Keylong and Kaza in the Himalayas at 13,000 ft with temperatures of -30C during winter. This presentation will summarise the operational challenges encountered by Apollo Telehealth Services (ATHS) the oldest and largest multi speciality telehealth network in South Asia in executing this turnkey project, for the Govt of Himachal Pradesh.

Methods: A tailor made specific solution was customised after a detailed need assessment study. ATHS took full responsibility for the entire project. The individual beneficiary did not have to pay for the services provided. Existing rooms in two government community health centres were converted to tele emergency centres by connecting them to a state of the art Emergency Department (ED) at the JCI accredited Apollo Main Hospital at Chennai, India. Training was carried out at both ends. Turn around time for an emergency teleconsult was less than 12 minutes Tele ECG, Spirometry, Xrays and a POCD (Point of Care Diagnostics) for blood biochemistry was available. Meticulous documentation, regular reviews resulted in real time corrections if required. A specif call centre team ensured follow up studies.

Results: In 31 months 638 emergency tele consults were provided out of 9194 constituting 6.93 %. 353 tele laboratory tests were done in an emergency setting. Of the 16 cases of myocardial infarction diagnosed six were thrombolysed thru tele mentoring. Six patients were defibrillated thru telementoring. 10 died on site. 174 were stabilised and transferred to higher centres including 13 helicopter evacuations. Detailed analysis revealed that, a single emergency teleconsult actually cost the government only 212 euros.

Conclusions: A Programme Management approach with optimized capacity utilization, ongoing impact assessment, process re engineering, with confidence, knowledge and experience helped make the impossible possible. A dedicated technology enabled, state of the art ER team with a committed passionate team at the remote end enabled 24/7 tele emergency care in a socially relevant, financially sustainable and scalable PPP mode. Tele Laboratory services was a valuable adjunct.

P-18: IoT and violence against gay people in Brazil: time for action

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Background: Transgender Europe (TGEU) reveals in the Trans Murder Monitoring (TMM) project that 78% of all murdered trans and gender-diverse were reported in Central and South America between 2008 and 2016. It is a global public health problem. In Brazil, only in 2017, 172 transgender were killed¹.

What for is this project: This work is a result of the national research Divas² with the FIOCRUZ, Johns Hopkins University and the Brazilian Department of Surveillance, Prevention and Control of STIs, HIV / AIDS and Viral Hepatitis, with financial support from UNESCO. It is to combat the transphobia³ with telehealth activities in Brazil. The principal aim is to elaborate, in a participatory way, a strategy of intervention through digital health tools that allow the LGBTI population to inform themselves, denounce, register, confront and avoid various forms of violence to which this population is subject. We will use the network of physical devices, smartphones and tablets, to implement and potentialize this action with the support of big data analytics.

Results: Focal groups with the population³ indicates three integrated activities:

1. To develop two mobile applications, one aimed to transsexual women and transgendered men, and one aimed at the LGBTI population in general, which allows these individuals to report, record, confront and avoid many forms of violence, in addition to establishing support networks for victims.
2. To use different web-based applications such as specific website, blogs (eg youtube), micro-blogs (eg Twitter) and social networks (eg Facebook) in order to inform LGBTI people about different forms of violence, laws in force, addresses and support networks for the care of victims, among other related matters.
3. To hold a national meeting with the objective of presenting the project results and building, together with the LGBTI population, leaders and NGOs, strategies for fighting against the increased violence that LGBTI people are subjected to in the country.

We are developing for IOS and Android, using the prototyping techniques based on design thinking⁴, which may be just screen navigation or have all possible interactions in the mobile application.

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P-19: Legal aspects of Cross Border Telemedicine between Morocco and the European Union

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Telemedicine becomes cross-border if the patient or the healthcare provider using or delivering telemedicine services are residing in different countries. Cross-border telemedicine presents opportunities for health systems but poses additional legal obstacles. This work examines the regulatory challenges associated with cross-border telemedicine in general and between Morocco and the European Union in particular. For a national exercise, the question of the place of delivery of the service is minor but it is more complicated when it is a cross-border one as countries present number of differences in legislation, implementation, technology, planning, terminology, semantics, and language. The cross-border practice of telemedicine seems compatible with the rights of the patient as stated by the Directive 2011/24/EU on the application of patients' rights in cross-border healthcare. There are key specific legal issues related to the provision of cross-border telemedicine: licensing/registration of health professionals performing cross-border telemedicine services, the conditions for legal processing of health data and data protection, the right of reimbursement of a cross-border telemedicine act, the determination of potential liability, and the identification of the relevant competent jurisdiction and applicable law. Cross-border healthcare can have advantages for market healthcare as competition from foreign health care providers can increase efficiency. However, reimbursement of cross-border telemedicine is unclear. In Morocco, in order to allow cross-border telemedicine, the policymakers are called to update and extend the national law of telemedicine to include cross-border telemedicine. This can be envisaged within the frames of the European Moroccan Association treaty in the context of the advanced status of Morocco. Alternatively, bilateral agreements with the European member states should address the issue.

P-20: mHealth solutions for managing the nigerian army medical corps (name) patient inflow using computing edge technology

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The Nigerian Army Medical Corps (NAMC) and by extension the entity of the Armed Forces of Nigeria (AFN) Medical facilities combined have built and developed over many years the most extensive and widest coverage of medical infrastructure network across Nigeria investing valuable Nigerian resources in the training and equipping of Army personnel in all medical fields of specialty. Considering the availability of smart phones and internet penetration which has increased significantly in the Nigerian population statistically by about 70% and 55% respectively, and with a niche/mission to put the NAMC Infrastructure to the overall common good of both troops and the Nigerian Citizenry via mHealth Solutions; the proposed Medcorp mHealth app was conceived/perceived as a viable solution to tackle challenges being faced in the healthcare sector in Nigeria and Africa at large thereby not only meeting the basic healthcare requirements of every Nigerian for a healthy Nigeria but also further aid the spread and practice of Telemedicine & eHealth in the Sub-Saharan African Region.

As such in this paper, the development of a mobile app for the management of patient inflow is described. This focused on the design, implementation and installation of the application on a portable mobile android device. The application allows patient to input their vital signs, forward the information to a doctor with the same app; the information is processed and the patient attended to immediately and those that require visiting a hospital are put on appointment. The exchange of data is done backend and frontend through highly encrypted web services to provide data security.

The application was tested on a software simulator in Eclipse IDE with the android development kit (ADK) serving as the virtual interface devices. Final validation of the designed application was done on a mobile phone running the android operating system.

P-21: National benchmarking of nursing-sensitive outcomes: initial steps in Finland

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Background: In its eHealth Action Plan 2012-2020, European Commission defines that the aim of eHealth services is to use them to improve clients' health, the effectiveness and productivity of health services, and the social and economic value of health. eHealth services embrace the interaction between clients and health care service providers, the transfer of information between health care organizations or peer to peer communication between patients and/or health care professionals. Thus, benchmarking is crucial in continuous quality improvement and can be used to evaluate patient safety and quality performance in health care organizations. Internal benchmarking is used to identify and compare best practices within an organization, and to compare performance over time. External benchmarking is essential for accreditation purposes and can be seen as a process of seeking out and implementing best practices by collaborating among several organizations. Successful benchmarking requires careful planning of the process, monitoring of the relevant indicators, and - to enhance learning and continuous improvement - staff involvement. The eHealth Strategy 2015-2020 of the Finnish Nurses Association outlines that information generated through the interaction between clients and professionals will be used e.g. for development purposes. Every nurse will have the same possibilities to access the information and the competence to utilize it. Best practices in nursing will spread rapidly nationally and internationally.

What for is this project: In Finland, the National Institute for Health and Welfare offers a platform to compare performance indicators within e.g. specialized health care. However, these indicators do not cover nursing-sensitive outcomes which reflect the quality of care given by nurses and are of great interest and importance among nurse leaders. Therefore, to fulfill the aim given by the Chief Nursing Executives of the five Finnish university hospitals, nursing developers / experts in those organizations started to explore the possibilities of benchmarking relevant nursing-sensitive outcomes. The following steps have been taken: 1) selection of relevant outcome indicators that are also consistent with international accreditation programs, such as Magnet® Program; 2) identification of potential obstacles in uniform data production; 3) decision on a relevant schedule for producing benchmarking data; and 4) search for potential vendors to build up the database and reporting system.

Results: So far, consensus has been reached to include the following nursing-sensitive outcomes in benchmarking: patient falls, pressure ulcers, risk of malnutrition, pain management, catheter-associated urinary tract infections, central line-associated bloodstream infections, nursing-sensitive patient satisfaction, nurses' organizational engagement (work satisfaction), hand hygiene, and safety of medication process. Data of nursing-sensitive patient satisfaction has been collected three times in 2017 with a one week period. Data of nurse engagement will be collected in February 2018. The future steps in data collection will be decided on in the beginning of 2018. So far, all the university hospitals and one central hospital are involved in data collection.

The organizations are in different phases in implementing best practices regarding the aforementioned issues. Therefore, continuous electronic data production through e.g. nursing documentation is not possible. Manual data collection using prevalence approach is time-consuming and cannot be the final solution. Also, finding an outside vendor is essential for analyzing and reporting. Data of the nursing-sensitive patient satisfaction will be analyzed so that they can be reported in the presentation.

P-22: Necessary skills for professional communication between nurses and hospitalized geriatric patients

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Background: The nursing profession is a specific activity that requires certain communication skills. For the development of individual, effective plan for medical care and education the nurse can rely entirely on her communication skills. Caring for geriatric patients also require professional competence and specific communication skills. The objective of the study is to investigate and analyze the level of communication between the nurse and the patient, as well as his relatives, during the hospitalization. Respondents through an anonymous survey of 392 patients aged over 65 received treatment in surgery, internal and emergency department of the Hospital "St. Panteleimon", Hospital "Plovdiv" - Plovdiv, University Hospital "Caspela" - Plovdiv, University Hospital "Trimontsium" - Plovdiv, University Hospital "Eurohospital" - Plovdiv, University Hospital "Pulmed" – Plovdiv.

Methods: Statistical evaluation was performed by descriptive statistics to describe the results. The results are represented by an arithmetic mean and a standard error (mean and Std. Error). The data was processed through SPSS statistical software package ver.16.0.

Results: Analysis of the results shows that nurses are able to communicate with patients and no problems during the communication occurred. Disturbing is the fact that not a small percentage of the health professionals do not communicate with the relatives of patients. The respondents placed first as the main reason for disturbances in the relationship between them and the medical staff - the specific age of the patients (51.8%). An essential element in the work of a medical specialist is the ability and knowledge on how to interact with geriatric patients. In fact, without effective communication, the efforts of the healthcare professional will not have the necessary effect, because in the communicative process, important information, which is the key to quality health care, is exchanged. Regardless of the new technological challenges of the 21st century, the patient will always look for contacts with professionals who will expect human communication, understanding, sympathy, empathy and support.

P-23: Practice Audit in Urology: The value of Electronic Health Records (EHR) Data- A Case Study

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Introduction and Objective: Electronic Health Records (EHR), a software that captures data of patient encounter has gained traction, with varied applications, in the past decade. We adopted the use of EHR in 2013. The aim of this study is to describe the value of Electronic Health Records Data in Practice Audit with a focus on Ureteroscopy.

Methods: Data recorded in the physician's clinical notes, OR records, and follow-up assessments were reviewed and extracted. Data collection and analysis was from 2001 to 2004 and included patient's age, sex, presentation, stone features, OR, and fluoroscopy times, stent or no stent, stone free rates, and complications. Data was transferred to and analysed by a random number spread sheet function.

Results: There were 192 procedures-149 'stent' and 43 'No Stent' (3:1). These two groups were comparable -patients, stone features, stone free rates, complications. Mean stone size was 8.5 +/- 2 mm. Stone free rate at 6 weeks was 100%.in both groups. After 2 days, lower urinary tract symptoms. (LUTS) were less in patients with 'no stent' in contrast to 'stented' patients. These results are similar to published literature.

Conclusion: We identified comparable outcomes in Ureteroscopy 'Stent' or 'No Stent' – a situation that remains controversial. EHR as a tool in practice audit is invaluable. It is a welcome alternative to a 'paper' audit. There are limitations. Other uses of EHR data in research, quality improvement and population studies are promising.

P-24: Reaching the unreached: An innovative eHealth initiative in Nepal

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Since 2009, we have launched an initiative utilizing innovative technologies as a platform for providing services aimed at overall community development. A real-time tele-conferencing setup is used to provide consultation services for patients with skin diseases and the same infrastructure is also used to provide education and other skill development training services to rural communities as per their needs. Our vision is to improve the living conditions and livelihood of people through sustainable community development-planned, designed and implemented jointly with their context in partnership with individuals and communities. Our mission is to improve people's overall quality and standard of life, through health, education and services through tele-health and e-Health, long term integrated rural community development programs. And special focus is given on the poor, marginalized, deprived and disadvantaged people and community groups in remote, difficult to reach such communities

**P-25: SoteNavi – a training project of SMEs and associations -
Digitalisation as one of the main cornerstones of the training
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Health, social services and regional government reform is a large administrative and operational overhaul in Finland. The reform impacts social and health care sector's micro-enterprises, SMEs and associations broadly.

In the future, they will have a big role as producers of welfare services. The reform means that the structure, services and financing of health and social services will be reorganized. This entails different kind of challenges, requirements and needs to the target group of the project (micro-enterprises, SMEs and associations). The main aim of the project is to increase work welfare and productiveness by providing diverse methods of training and networking known to be important from the viewpoint of work welfare and productiveness.

The project wants to:

1. Develop the skills of the target group. Skills to be developed are related e.g. to work welfare, productiveness,
2. management of change, digitalization, marketing and service design.
3. Create and build local and national networks between different actors and utilize different methods (e.g. mentoring).
4. Plan, develop and assess best practices and good procedures in order to increase the work welfare and
5. productiveness in the enterprises and associations.
6. Find out how to measure the work welfare and productiveness of the target group.

The project will:

1. Examine a present state of the work welfare and productiveness
2. Arrange local training workshops
3. Arrange national seminars
4. Create a mentoring programme based on the needs of the target group
5. Build local and national networks
6. Implement and assess the best practices in order to increase the work welfare and productiveness

As a concrete result, the project will produce a digital navigator, which includes tools that help the target group to increase the work welfare and productiveness. The tools are related to topics like service modelling, how to improve the management of change in the organizations and ways to advance the digitalization, marketing and communication skills of the organization.

In the beginning of the project, were gathered information with the survey for development of the training project e.g. of the challenges of the digitalization in the SMEs and associations. Following results were founded: the participants believe that digitalisation will help them in their daily work and will give them new usable tools for their work. Especially documentation, reporting, contacting and interaction possibilities will increase. On the other hand they are afraid of that they will miss the time from the clients in becoming familiar with the new technology (programs, application, equipment). The participants think positively digitalization as a change to create new possibilities to develop organization processes.

The European Social Fund funds the project. The project has started 3/2017 and will be finished 2/2019.

P-26: The Nursing Informatics Certification

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Finnish Nursing Association has eHealth Strategy. The strategy is also a part of the development of national and international digitalisation, which involves both the reform of external and internal procedures, and making the digitalisation of services client oriented [1]. The strategy's objective is to strengthen the role of nurses in developing and implementing services as a feature of nursing work and in reinforcing the involvement of citizens in self-care and self-management. This work requires a new kind of competence from nurses [2]. Since 2012 nursing certificate in Nursing Informatics (NI) has been available for members of the Finnish Nurses Association (FNA). The applicant must be a RN and a member of FNA. The evaluation is based on a portfolio which the applicant must draw up as a proof of the accomplishments in her/his post-degree career in three categories: work experience, formal education and cooperation and developmental activities relating to nursing informatics specialty.

You can find more information from associations' webpages

- <https://www.telemedicine.fi/fi/> or
- <https://sairaanhoitajat.fi/koosteet/erityispatevyysnimike/>

Awarding criteria has been updated in the spring 2017 to meet the other criteria of professional cooperative organizations, as well as nursing informatics and information technology in today's nursing content. The purpose of Nursing Informatics Certificate is to 1) support and motivate nurses to develop their skills in evidence-based nursing and thereby promote the effectiveness of nursing. 2) to provide alternative ways to develop professional skills through training, work experience, and multidisciplinary, exploratory and developing work. and 3) to make the nurses' professional skills necessary for their work visible. 4) to support nursing alternative career path as nursing informatics. [3]

Nursing informatics certificates have been awarded to six nurses and two of them have renewed. To get the certificate for Nursing Informatics is the applicant must demonstrate that she/he has the expertise of a Nursing Informatics area. The granting of a special qualification about Nursing Informatics it requires knowledge (education) and skill (work experience) skills as well as expertise to work in co-operation with multiprofessional working groups. In addition, the applicants are required to develop themselves, their own professional skills and the entire work community. Even applying for a speciality certificate guides the career planning, systematic, and versatile development of expertise. [4.]

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P-27: Telehealth Nursing Research – Literature Review 2017

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Background: Nurses work in many telehealth-telemedicine settings, from ambulatory care to intensive care. However, telehealth research literature has not been reviewed specifically to discover nurse researchers reporting on their work in telehealth.

Aim: The aim of this study is to present information about nurse-led research in telehealth.

Methods: A medical librarian who regularly reviews dozens of tables of contents of health-related publications forwarded to this author all telehealth research publications found in her ongoing systematic reviews. Telehealth publications from 2017 were then evaluated and those papers with a nurse as first-author were used as the basis for this study. More than 40 papers were then reviewed for source country(ies), research purpose, research design and findings.

Results: Seventeen countries from five continents were represented by one or more papers. The research purposes described in the papers always concerned aspects of telehealth-telemedicine but they were quite diverse. More than 30 different topics were represented in the sample; diabetes, chronic disease, hypertension, parents, and patient-provider dyad were each studied more than one time in this sample but the remainder of the papers addressed single-study topics. Qualitative/descriptive designs were most common, with reviews of literature, technical evaluations and quasi-experimental designs also represented. Findings included information about mHealth users' perceptions; nurses receiving remote direction for stroke assessment and intervention; phone counseling; mHealth interventions for orthopedic surgery rehabilitation, weight loss, hypertension management, online support of urine catheterization, suicide prevention and pain management; smartphone use among nurses and physicians; electronic health record implementation; evaluation of apps and platform availability and efficacy; and nursing students' use of mHealth for care delivery. The findings were mixed, with some positive results from interventions but more often no differences were found with the interventions or between intervention and control groups. The health-related apps evaluations found the apps insufficient and the one evaluation of mHealth platforms found them unsatisfactory.

Conclusions: These studies represent a good cross-section of nurses researching telehealth-telemedicine by country and by topic. Continued work is most definitely needed to demonstrate telehealth nursing interventions that result in positive outcomes such as decreased length of stay and decreased re-hospitalization for people with healthcare needs. More intervention-control studies are needed. A reference list will be provided with the presentation.

P-28: Towards interactive patient counselling

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Background: Societal and health care needs and services are rapidly changing. The responsibilities of medical professionals and patients will be different in future hospital and primary care environments. Currently, patients are not satisfied with the provided information and they do not understand the counselling material, which is often written from the point of view of professionals. Patients should be informed of the benefits as well as the potential radiation risks of the radiological procedures they undergo. It is important to focus on what a person in the patient's position would like to know about the risks and benefits of an examination involving radiation exposure, instead of focusing on what a physician thinks the patient might want to know. Due to the aforementioned reasons, it is important to rethink and re-develop the treatment pathway, counselling materials and methods as well counselling environments of a patient. Patients should be in a central role also in the production and continuous development of both counselling materials and patient pathways.

What for is this project: The diagnostic pathway of a coronary artery disease (CAD) patient from the first symptoms to the diagnosis and treatment is dependent on the risk classification of a heart attack. Different diagnostic pathways of CAD patients will be analysed from the patient registers in the specific catchment area of Oulu University Hospital (OUH, five central hospitals). Group of patients will be interviewed using different serving design tools (e.g. patient interviews, visualization, context mapping, shadowing, service safaris, stakeholder maps, customer journey maps). Patient profiles lay the groundwork for the developed counselling environment and describe different types of patients. These personas will be made according to the process of service design and they are concrete descriptions of patients with CAD. Personas comprise not only demographic characteristics, but also patients' needs, values, lifestyle, culture, health status and personal background. Personas help to focus on real users when designing new counselling material and methods for diagnostic pathways in cardiology. Personas help patients to commit more into self-care, which releases the attention of health-care professionals to patients with critical condition. Social and healthcare costs during 2016 will be find out on two areas. The aim is develop modern, interactive, and personalized patient-centered counselling environment for and with patients.

Results: Patient counselling materials and forms will be based on results of the patient register analysis, interviews of patients and relevant experts (e.g., healthcare professionals), and systemic literature reviews. Data collection and analysing are going on and the first results will be reported in poster in the congress.

P-29: Use of Data Cloud Services in Clinical Environment. Case: video-EEG

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Background: The first cloud-based video EEG equipment in the Nordic countries and the cloud computing services they need have been implemented in the Päijät-Häme Center Hospital's operating environment. The use of cloud services is not yet routine health care in Finland due to several factors; eg the suspicion / control of IT departments and the loss of revenue / security features.

Objectives: The aim of this study was to study how the new philosophy of EEG equipment influences the functioning of the hospital's Department of Clinical Neurophysiology and, consequently, to modify the methods and to develop new functions. Currently, cloud services are not used extensively.

Methods: Yin (2009) case study was used as a research strategy. The research material was used for hardware and related documentation, the observation during the deployment process, and interviews.

Results: A new type of application enables new and more diversified methods compared to the current (local storage). These include: wireless, cloud, real-time online surveillance of nursing staff and physician without site connectivity. Although the hardware manufacturer has primarily designed the video for EEG recording in homes / hospital hotels, it was found to be well suited for use in hospital departments where ambulatory EEG recordings are needed.

Conclusions: The small size, movability and wireless capability of the device facilitate and streamline the care and patient mobility, etc. The image of two high quality HD cameras enables considerably more current equipment (1pc 640x480) better image quality, which facilitates analysis and analysis accuracy when analyzing take into account the EEG curve and the improvement in image quality (eye / facial movements) of the video corresponding to the deviation of the curve. Cloud storage also allows analysis of results to be carried out anywhere in the world that can be connected to the cloud

References:

R. Yin (2009). Case study research design and methods, Thousand Oaks: Sage Publications.

P-30: Using Social Robotic Cat in Dementia Care: A Case Study

**A-L. Arjama^{1,2}, MHS (student), Unit Director; A. Hägman-Laitila¹, Professor;
M. Kangasniemi¹, Docent, PhD**

¹University of Eastern Finland; ²Helsinki Deaconess Institute

The main goal of dementia care is to improve the quality of life because there is not available cure for dementia. Development of care is topical right now because the incidence of dementia is increasing dramatically. Social robots are one option to support individuals with dementia because they can be used as tools for communication and to offering positive emotional experiences. The aim of this study is to describe formal and family caregivers' perceptions of individuals with severe dementia with an interactive robotic cat.

We used case study with an intervention as a method. The material was collected in two dementia-care-units in Southern Finland in 2016. On the intervention three individuals with severe dementia had robotic cat for 12 weeks. During the intervention, the formal caregivers observed reactions of the participating individuals. Assessing of agitation symptoms was conducted by Cohen Mansfield Agitation Instrument (CMAI) scale and quality of life using the QUALID scale. The measurements were analyzed by comparing the average of measurements in different stages (baseline, intervention and follow-up). We used thematic interviews to collect data concerning the formal and family caregivers' perceptions and experiences of the robotic cat in the participants' daily lives. Interviews were analyzed using qualitative content analysis.

Based on our results the scores of CMAI and QUALID remained the same during the intervention and follow-up. The scores decreased with one participant during the intervention and follow-up. The scores of the third participants' got higher during the intervention and follow-up so each individual reacted differently to the use of the robotic cat.

Based on our results, family caregivers' and formal caregivers' found that the reactions of the participants towards the robotic cat were unique and there were variation according to the individual, timing and situation. The perceptions concerned the functionality of a robotic cat in dementia care, the reactions towards the robotic cat and implementing care with robotic cat. Ethical consideration was an important part in each category. Robotic cats can be a useful tool for communication and by using them it is possible to relieve the agitation symptoms and offer positive emotional reactions for individuals with dementia. The caregivers' attitude, know-how and prejudices together with experiences during the intervention affected the eagerness to use the robotic cat.

This case study highlighted the importance of individual care. In the future more knowledge is needed of the wellbeing of individuals with dementia. It is also important to explore data collection methods in dementia care. In addition to the importance of getting new information of the use of social robotic cat, the intervention studies are a good opportunity to increase the knowledge of technological innovations among caregivers.

P-31: Virtual Clinic for Oral Health Care (VIRSU)

**Kaarina Sirviö¹, PhD; Tiia Ranta-Pere², MSc; Liisa Suominen³, PhD;
Tiina Joensuu⁴, PhD; Jukka-Pekka Skön¹, DSc (Tech)**

¹Faculty of Health Care, Savonia University of Applied Sciences; ²Service area of Health Care, City of Kuopio; ³School of Medicine, University of Eastern Finland; ⁴Department of Dentistry, Kuopio University Hospital

Oral health care services are an important part of the ongoing social and healthcare reform. One of the main goals is to improve the citizen's ability to take care of their own health and life. The importance of digitalization in health care services needs to be strengthened. In addition, in oral healthcare, digital service models change traditional service activities and challenge the development of personnel skills and the changing of job images and work structures so that the use of technological applications becomes part of their job.

The VIRSU project aims to utilize virtual and augmented reality environments and gamification methods to develop virtual clinic for oral health care. In addition, new models for digitalization oral health care services will be investigated and tested in the city of Kuopio. Further, project aims to accelerate the development of the market for digital oral health care services in Finland.

The VIRSU project will be realized in cooperation with Savonia University of Applied Sciences (coordinator), University of Eastern Finland, Kuopio University Hospital, City of Kuopio, Futudent Oy, Hammaslääkäripalvelu Savodent Oy, Esteettisen Hammashoidon Klinikka Oy Hannu Vesanen, Suun Terveyspalvelut HYMY Oy and Plandent Oy.

P-32: Web-based education quality assessment system in medical higher schools (conceptual model)

Ass. Prof. Kristina Kilova K¹

¹Department of Medical Informatics, Biostatistics and E-learning, Faculty of Public Health, Medical University of Plovdiv, Bulgaria

Quality and its assessment are essential for modern management of the educational process. It is included in the mission, goals and tasks of every higher school detailing in collection, analysis of the needed information and consequent adequate management decisions. Constructive student feedback, establishment of systems of continuous control, and implementation of changes based on a scientific conceptual framework will help the education to move from quality assurance to quality improvement. The quality of education is a responsibility of all participants – lecturers, students, institution management. Automating the feedback process with students will lead to a faster analysis of the results, making adequate management decisions in order to achieve the ultimate goal – improving the quality of higher education.

In the present paper the need for regularly providing students with the opportunity actively to participate in the management of quality of education is justified. The paper deals with the automation of collection, analysis of the needed information and consequent adequate management decisions. A conceptual model of “Web-based education quality assessment system” in medical higher schools with a focus on the survey and its design are also presented.

P-33: Zero Mothers Die in Brazil: building bases for the pregnant E-patient at the National Institute of Women, Children and Adolescents Health Fernandes Figueira

**Silva¹, Angélica Baptista MPH, PhSc; Thouvenot², Véronique Inès MBA, PhD
A.Math**

¹Oswaldo Cruz Foundation, (FIOCRUZ) National Institute of Women's, Children's and Adolescents' Health Fernandes Figueira, Telehealth Laboratory; ²Millennia2025 Foundation "Women and Innovation", PuF, The Women Observatory for eHealth, WeObservatory

Background: The 2030 Sustainable Development Goal on health reinforces the fight against maternal mortality, which is a problem in developing countries¹, including Brazil².

Aim: This research intends to translate and adapt the Zero Mothers Die mobile application to the Portuguese Brazilian language with the participation of institutional actors. As well, we will listen to mothers and pregnant users of the service about the usefulness and the potentiality of this tool in its daily life.

Methods: As methodology, we are using the technique of ethnographic research called participant observation³ in the phase of translation of the platform by health professionals. Afterwards, we will conduct semi-structured interviews in groups with users of the health service. Our expected results are the dissemination of the methodology used for peers in scientific publication and the provision of the application for pregnant women and mothers in general.

Results: An international agreement was formed with a work plan and a research project was appreciated by a Ethical Committee. MD students, researchers and health professionals forms a multisectorial group⁴ to check and adapt the translation. ZMD is translated to brazilian portuguese language with this multidisciplinary team checking the clinical procedures.

Conclusion: We conclude that there are some clinical differences of treatment of the newborn⁵ that must be respected in order to guarantee the maternal and baby health in different cultures^{6,7}.

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Workshops

Testbed / Living Lab Open Forum

Time: Thursday 15.3.2018 14:40-16:40

Place: Viking Line M/S Mariella, Conference deck/styrbord

The Nordic Health Living Lab is a platform for all the actors involved in the home and health care in the Nordic region. These actors involve all those parties that form the chain of care information, namely, the patients, the relatives and care providers of the patients, patient associations, hospitals, companies providing measurements and testing as well as medical insurance companies.

As the greying societies are constantly growing and those who suffer from chronic diseases want to live in their own homes for as long as possible, there is a need to discover, develop, test, and deploy seamless communication and health technology solutions aimed at facilitating the care of chronic patients at their own homes.

Nordic Health Living Lab, NHLL, organizes a workshop Nordic Health Ecosystem onboard M/S Mariella on March, 15th. The workshop gathers existing home and health care testbeds and development environments under common cross-border umbrella in order to support private companies in improving and expanding their businesses. The aim is to identify similar networks and other players to team up and build a joint platform to present the services and enable companies to find and select suitable services for their needs.

NHLL joins eHealth communities, entrepreneurs, care givers and competence providers with a focus on building up an operational Nordic ecosystem.

We aim to make everyday care more individual, with no waiting times and at your terms. At your home. We aim to make systems, devices, care givers and studies to work at their best together. For you. By now, we have built up a ground for the Nordic healthcare ecosystem and a platform for innovators and flagships from Sweden and Finland. We welcome you to join us!



Workshops

New (gamified) applications for patient safety

Time: Thursday 15.3.2018 17:40-19:20

Place: Games for Health Finland suite

10 facts on patient safety (Source World Health Organization). Patient safety is a serious global public health issue. There is a 1 in 1 000 000 chance of a traveller being harmed while in an aircraft. In comparison, there is a 1 in 300 chance of a patient being harmed during health care.

1. Patient safety is serious global public health issue
2. One in 10 patients may be harmed while in hospital
3. Hospital infections affect 14 out of every 100 patients admitted
4. Unsafe injections decreased by 88% from 2000 to 2010
5. Delivery of safe surgery requires teamwork and good communication
6. About 20%-40% of all health spending is wasted due to poor-quality care
7. A poor safety record for health care
8. Patient and community engagement and empowerment are key
9. Most people lack the access to appropriate medical devices
10. Hospital partnerships can play a critical role

Come and see gamified prototypes to promote health and get new ideas to new patient safety solutions. During the conference there is a possibility also participate to eHealth2018 Game Jam. Try on new role in development and accept this challenge! You have possibility to hack the humanity challenging you to create technologies to address local and global issues.

This workshop is organized by Human Security Finland (HSF). A network of organisations focused on business and innovations for development, with core competencies in food, health and environmental security and ICT for development. Human Security Finland is driven by the premise that business partnerships are the key to sustainable development in crisis regions, fragile states and developing countries. The network consists of private companies, research, educational and nongovernmental organisations and financiers that together congregate competence to create holistic solutions with partners in target regions. Human Security Finland is the gateway to finding new partners, new products and solutions or testing new innovations.



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Games for Health Finland is a creative network of game developers, designers, health professionals and technology. By combining all these elements we can create fun and addictive solutions to promote health and well-being.

We also organize activating events like Game Jams to create prototypes for actual needs. Innovate, develop and implement together with the Games for Health Finland network!

www.gamesforhealth.fi

 [gfhfinland](https://twitter.com/gfhfinland)

 [gamesforhealthfinland](https://www.facebook.com/gamesforhealthfinland)

eHealth 2018 GAME JAM

15.-17.3



Finnish Society of Telemedicine and eHealth

Leverage from
the EU
2014-2020



European Union
European Regional
Development Fund

eHealth2018 Game Jam

Time: Thursday 15.3.2018 11:00- Friday 16.3.16:30

Place: Deck 8, Conference, S21-S22-S23

Games for Health is a new, emerging field that promotes well-being, health and functional capacity. These games have desired health outcomes and are used to encourage citizens to take responsibility for their own self-care. There is a huge amount of applications, technology and games that can be used as such or tailored to inspire and motivate different user groups to achieve health benefits. Games for Health Finland and bringing together a unique combination of expertise, innovation and cross-cutting know-how for the benefit of people's well-being.

Gamification gives us clear goals, proper challenges, interaction and rules for engagement, motivation, participation and inspiration for better life management. Simply put, gamification is about applying certain game-design elements and game principles in a non-game context. It offers users to perform activity that is completely immersed in a feeling of energized focus and enjoyment. Gamification can also improve individual's ability to comprehend digital content.

Health care sector should be seen as a living lab, a platform, where new, open, agile and user-friendly services are brought to life with a twist of gamification to engage the users. eHealth2018 Game Jam offers new prototypes and solutions for health promotion, disease prevention and sustainable healthcare systems.

eHealth2018 Game Jam is organized by Games for Health Finland and will be held as a part of eHealth2018 conference. Game Jam brings together healthcare professionals and game makers to create new ideas and ways to use eHealth technology and promote eHealth with gamification. Accept this challenge to create new solutions only in 28,5 hours.

In order to participate, you don't need to be a professional game developer or licensed physician. All skills are needed from programming to drawing. Game jamming is a constant learning process for beginners and pros alike, so come and learn together with others!

5 min rapid scientific presentation during the eHealth2018 Game Jam

- Games for Health Finland: Achievements and experience points
Tiina Arpola¹, MSc (Tech.), Antti Kotimaa¹, PhD
¹Savonia University of Applied Sciences

Related workshop: New (gamified) applications for patient safety, Thursday 15th March 17:40-19:20

Game Jam contact

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Subcommittees of the Finnish Society of Telemedicine and eHealth

Subcommittee for education and research

- The task is to monitor and educate educational studies and educational needs
- Information is disseminated on national and international conferences and participation in the field

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- Elina Kontio, Principal Lecturer
Turku University of Applied Sciences
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- Outi Ahonen, Senior Lecturer
Laurea University of Applied Sciences
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Subcommittee for physicians in charge of ict development

- Operates as a network for physicians interested in and developing electronic patient information systems
- Advertise on topical issues and training in patient information systems
- Accepts and attempts to push forward the development of patient information systems

Contact:

- Mirja Tuomiranta, Chief Physician
Hospital District of South Ostrobothnia
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Subcommittee for enterprise members

- Operates as a network for companies interested in telemedicine and eHealth
- Organize seminars and workshops of interest to companies as needed
- Communicate on topical issues and training

Contact:

- Raino Saarela
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- Arto Holopainen, Senior Digital Advisor
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Subcommittee for special competence for healthcare information technology

- Supports the work for special competence for healthcare information technology

Contact:

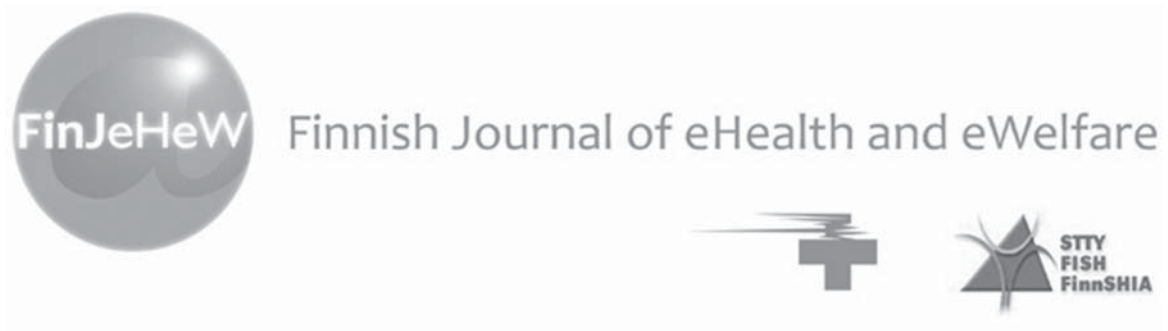
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Estonian sub organisation

- Estonian Telemedicine Association was established as a suborganization of the Finnish Society of Telemedicine and eHealth in 2007 in close relation with Estonian eHealth Foundation
- The goal of the Estonian Telemedicine Association is to connect the promoters of the Estonian telemedicine and eHealth through establishing cooperation and discussion forum

Contact:

- Monika Tartu
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Finnish Journal of eHealth and eWelfare

<http://www.finjehew.fi>

Finnish Journal of eHealth and eWelfare (FinJeHeW) is a scientific journal established by the Finnish Society of Telemedicine and eHealth (FSTeH) and the Finnish Social and Health Informatics Association (FinnSHIA), and it also serves as the official journal for the members of the establishers.

The Journal was established in 2009. The aim of the Journal is to promote scientific research, communication and education in the fields of information and communication technology relating to social and health care, telemedicine, eHealth and eWellbeing.

Financial assistance has been granted to the journal by the Federation of Finnish Learned Societies since 2010. FinJeHeW benefits the members of the associations further by functioning as an information channel, multidisciplinary publication forum, and supporter for the international network.

The Journal welcomes articles on information and communication technology of social and health care, telemedicine, eHealth, and eWellbeing. Instructions for authors can be found on the Journal website. FinJeHeW is mainly a Finnish language journal, but also includes articles, abstracts and other material in English. All submitted manuscripts are evaluated by the editor. Manuscripts that are considered suitable for publication in the Journal are sent to two referees for assessment. The Journal is published open access and includes four issues per year.

Journal ISSN index is 1798-0798.

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Integrating the Healthcare Enterprise (IHE) in Finland

IHE (Integrating the Healthcare Enterprise) is an international non-profit organization that works to improve the way healthcare systems share information electronically. IHE encourages the use of established interoperability standards such as HL7 and DICOM and strives to solve specific integration problems faced by its members in the real world through Integration Profiles. IHE Finland is a member of IHE International. IHE Finland has 38 members (December 2017).



Integrating
the Healthcare
Enterprise

BENEFITS OF USING IHE

- Optimize clinical workflow and strengthen the information link between different departments
- Streamline the flow of clinical information, reduce errors and improve efficiency
- Simpler integration and implementation
- IHE profiles fill the gap between standards and systems integration
- Clear path toward acquiring integrated systems
- Common framework and better communication for vendors and purchasers
- Flexibility while ensuring that key integration needs are met
- Provides common workflow and reduces the need for tailoring
- International development and publication of IHE Technical Frameworks

WAYS OF WORKING

- **Integration Profile Specification:** technical specifications for implementing standards
- **Connectathon:** opportunity for vendors to test the interoperability of their products with peer vendors
- **Projectathon:** tests your project specific configurations (vocabulary, document types, workflows, etc) in the context of the IHE profiles working together
- Preferences for established, complete standards
- Forum for collecting integration requirements, developing profiles and testing, for both vendor and user organizations

ADDITIONAL INFORMATION

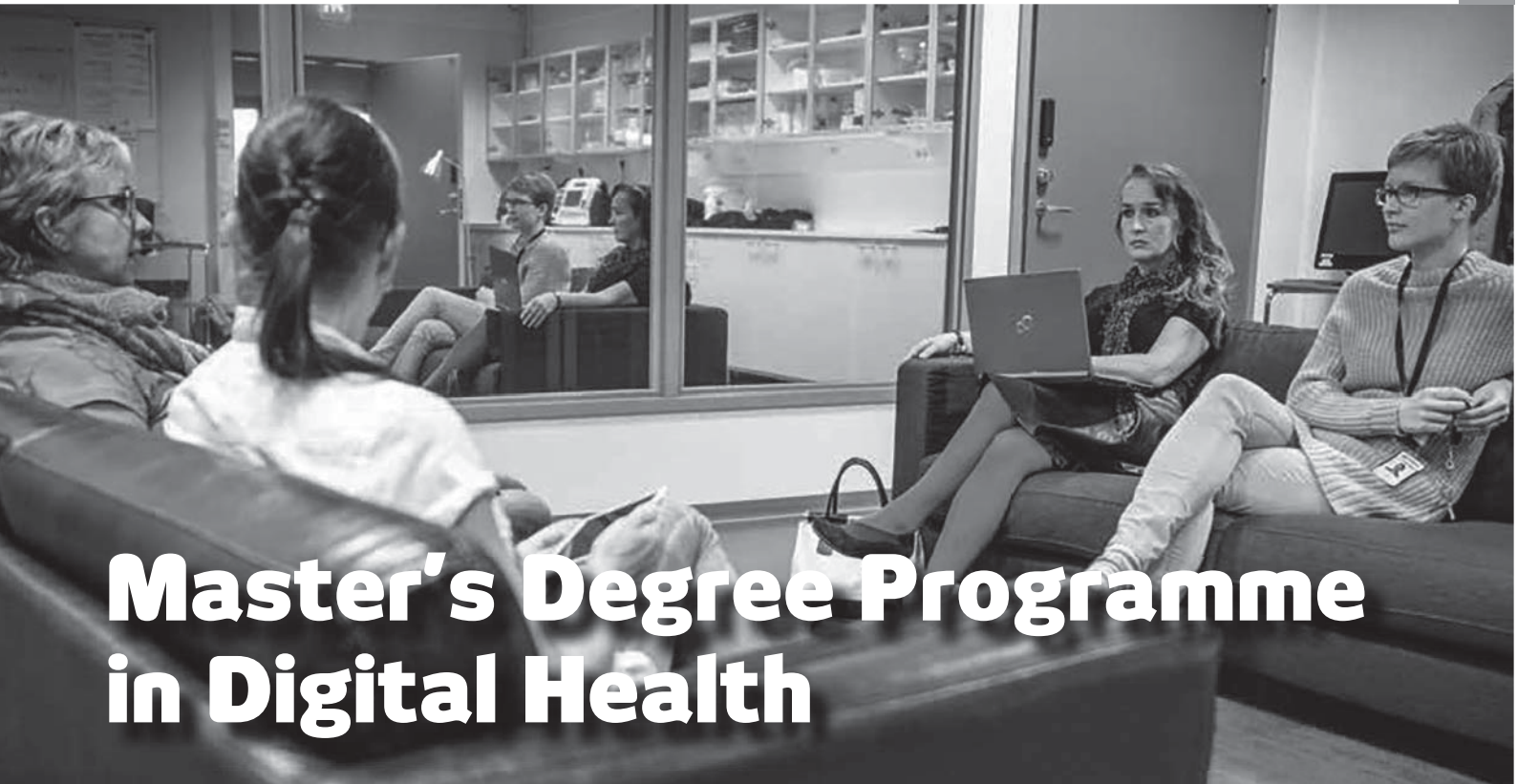
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WHAT'S NEW

- IHE Europe Connectathon and Symposium in The Hague 16.-20.4.2017.
- IHE Finland is investigating the applicability of new FHIR-based profiles (DCP for care plans and DCTM for care team management) for the needs of the health and social services reform in Finland.
- IHE support project going on to regularize IHE activities in Finland
- IHE Finland is participating to the XDS Metadata workgroup of IHE Europe.
- Background information, such as description of IHE procedures in Finland, essential IHE specifications in imaging as well as IHE utilization report by TEKES and FIHTA

JOIN US

- IHE activities directed to the needs of Finnish organizations
- Workshops organized to define focus points
- Support for concrete development projects
- National procurements start to require IHE profiles
- IHE Finland workshops are open to IHE Finland members
- Profiles and reports are free for evaluation and use
- To follow and participate
<http://www.hl7.fi/hl7-finland-liity-yhdistykseen>
<http://www.hl7.fi/sig-toiminta/ihe-sig/>
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Management and Leadership in Health and Social Services MBA

The MBA program, implemented by Laurea University of Applied Sciences, provides competence training in management, leadership and customer-oriented service management. The Health and Social Services-sector is up for major changes in the near future, and this MBA program prepares its participants for this. The main aims of the education are to be flexible and sensitive towards the point of view of the participants' competence development, changes in the professional environment, research of specific topics and the latest and future innovations. The implementation model and content of the training is designed to serve the career path of each participant and to strengthen leadership and development skills.

The main subjects of the Management and Leadership in Health and Social Services MBA are: *the future of the operating environment, self-management, service design, change management, knowledge management and economic knowledge*. The duration of the program is approximately 2 years and the teaching language is Finnish. If you are interested in an English version of this program, or you would like to have this MBA exclusively for your organization, please contact us.

We are pleased to offer educational and consulting services for your organization. Please contact us!
For more information about the program: Outi Perhiö (MBA program manager), outi.perhio@laurea.fi, +358 44 358 5841.



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#eHealth2018 Cruise Route and Time Schedule



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- Hanna Hytönen, Savonia University of Applied Sciences
- Susanna Vettenranta, Laurea University of Applied Sciences
- Tomi Vepsäläinen, Savonia University of Applied Sciences

List of participants

Name

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Abara	Nkeiru	Richmond Hill Urology Practice & PI
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