E-Health Systems Quality and Reliability: Models and Standards

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## Detailed Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>xv</td>
</tr>
<tr>
<td>Preface</td>
<td>xvi</td>
</tr>
<tr>
<td>Acknowledgment</td>
<td>xxii</td>
</tr>
</tbody>
</table>

### Chapter 1

**General Principles and Logic of Quality Management in Health and Healthcare**

*Aleš Bourek, Masaryk University, Czech Republic*

The chapter addresses the logic, principles and functionality of health and health care systems to present a framework for revealing, understanding and implementing appropriate and adequate management interventions leading to qualitative improvement in the specified areas.

### Chapter 2

**eHealth: Three Main Features of Modern Healthcare**

*Jana Zvárová, Institute of Computer Science of the Academy of Sciences of the Czech Republic, The Czech Republic*

*Karel Zvára, EuroMISE s.r.o., The Czech Republic*

This chapter describes how the scheme proposed by J.H. van Bemmel in 1984 can be used for classification of e-health applications. Apart from the electronic component of e-health applications, they consider two other features connected with health economics and environmental health.

### Chapter 3

**The European Perspective of E-Health and a Framework for its Economic Evaluation**

*Paola Di Giacomo, University of Udine, Italy*

The chapter states that e-health is a priority of the European i2010 initiative. She concludes that the attention towards electromechanical systems means the realization of tools of small dimensions, which have considerable advantages and greater diagnostic-therapeutic effectiveness. Therefore, an economic analysis has to take into consideration the use of biomedical technology, the study of alternatives, the choice of the economic evaluation method, and the identification and quantification of the costs and benefits.
Chapter 4
E-Health: A New Framework for the Patient-Physician Relationship

Susana Lorenzo, Hospital Universitario Fundación Alcorcón, Spain
Gilberto Llinas, Miguel Hernandez University, Spain
Jose J. Mira, Miguel Hernandez University, Spain
Emilio Ignacio, Universidad de Cadiz, Spain

The chapter probes into the impact of the Internet on some aspects of patient-centeredness. They write in support of the patient as a prudent actor who rationally decides where to go and what to do. However, they are prompt in stating that many patients are not familiar with the exact definition of e-health, and the terms associated with e-health.

Chapter 5
E-Health: A Bridge to People-Centered Health Care

Anastasius Mountzoglou, the Hellenic Society for Quality & Safety in Healthcare & European Society for Quality in Healthcare, Greece

This chapter elucidates that people-centered health care represents a structural change in thinking, which encapsulates before anything else the consideration of the patient. On the other hand, a global e-health agreement is beginning to take shape on the involvement of stakeholders, the interoperability, and standards. Consequently, e-health can have a remarkable impact on people-centered care, despite the challenges of implementation and adoption.

Chapter 6
ISO 15189:2007: Implementation in a Laboratory Information System

Stavros Archondakis, 401 Athens Army Hospital, Greece
Aliki Stathopoulou, Hellenic Accreditation System, Greece
Ioannis Sitaras, Hellenic Accreditation System, Greece

The chapter analyzes the guidelines concerning the use of laboratory information systems for medical records storage and retrieval. They affirm that post-examination procedures, such as authorization for release, reporting, and transmission of the results have a dramatic impact on laboratory quality improvement.

Chapter 7
Safe Implementation of Research into Healthcare Practice through a Care Process Pathways Based Adaptation of Electronic Patient Records

V. G. Stamatopoulos, Biomedical Research Foundation of the Academy of Athens, Greece & Technological Educational Institute of Chalkida, Greece
G. E. Karagiannis, Royal Brompton & Harefield NHS Trust, UK
B. R. M. Manning, University of Westminster, UK

This chapter outlines an approach which focuses on establishing and then using existing end-to-end care process pathways as early benchmarks against which to assess the effects of changes in clinical practice in response to new clinical knowledge inputs.
Chapter 8
Quality Assurance in Evidence-Based Medicine

Ioannis Apostolakis, National School of Public Health, Greece
Periklis Valsamos, Greek Ministry of Health and Social Solidarity, Greece
Iraklis Varlamis, Harokopio University of Athens, Greece

This chapter clarify that evidence-based medicine (EBM) refers to the careful consideration of all the available evidence when making decisions about the care of the individual patient. Moreover, they recognize that EBM still remains a complex and delicate process which needs Quality Assurance (QA).

Chapter 9
Quality and Reliability Aspects in Evidence Based E-Medicine

Asen Atanasov, Medical University Hospital “St. George”, Bulgaria

This chapter provides a brief overview on some e-medicine resources and global definitions focused on the three main subjects of the healthcare quality – the patient, the costs and the evidence for quality. He also mentions sites that assist in the retrieval of information about methods for obtaining evidence along with the ways of measuring evidence validity.

Chapter 10
Safety and Security in Professional and Non-Professional E-Health and Their Impact on the Quality of Health Care

Suzana Parente, Portuguese Association for Quality in Health Care, Portugal
Rui Loureiro, Portuguese Association for Quality in Health Care, Portugal

This chapter provides some basic ideas on e-health safety and security, focusing on the provider perspective. They present one novel unpublished case and six cases from the Food and Drug Administration (FDA), Multi-Media Consumer Information, (FDA) Patient Safety News. Topics highlight fraud, impersonation of health care professionals, misuse of data and information, and backups.

Chapter 11
Measuring Safety of Care

Solveig Kristensen, European Society for Quality in Healthcare, Denmark
Jan Mainz, European Society for Quality in Healthcare, Denmark
Paul D. Bartels, European Society for Quality in Healthcare, Denmark

The chapter points out those patient safety initiatives which have been launched in a number of countries, primarily focusing on problem identification, learning and improvement. However, so far there has been little emphasis on monitoring outcomes and surveillance of development of patient safety at the organizational and system level. They conclude that patient safety is a new field, which requires much more research-based documentation, and a comprehensive approach on a number of different measuring dimensions.
Chapter 12
An Information Technology Architecture for Drug Effectiveness Reporting and Post-Marketing Surveillance
Amar Gupta, University of Arizona, USA
Raymond Woosley, Critical Path Institute, USA
Igor Crk, University of Arizona, USA
Surendra Sarnikar, Dakota State University, USA

This chapter refers to an information technology architecture for enabling the monitoring of adverse drug events in an outpatient setting.

Chapter 13
Exploring Linkages between Quality, E-Health and Healthcare Education
Christopher L. Pate, St. Philip's College, USA
Joyce E. Turner-Ferrier, St. Philip's College, USA

The chapter explores the concept of e-health as it relates to healthcare delivery, healthcare quality and education. They address these relationships by discussing and defining the concept of e-health, discussing fundamental linkages between e-health and quality-related healthcare outcomes, and highlighting key themes between health education, technology and quality.

Chapter 14
Gastrointestinal Motility Online Educational Endeavor
Shiu-chung Au, Tufts Medical Center, USA
Amar Gupta, University of Arizona, USA

This chapter illustrates a site, which is being developed for the field of Gastrointestinal Motility. The site augments the innovations of existing healthcare information sites with the intention of serving the diverse needs of lay people, medical students, and experts in the field.

Chapter 15
An Evaluation of E-learning in Healthcare
George Athanasiou, University of Patras, Greece
Nikos Maris, Technical University of Crete, Greece
Ioannis Apostolakis, National School of Public Health, Greece

This chapter examines the structural transformation of the learning process, the paradigm shift of collaborative, and community learning, and the necessity of quality assurance of all learning assets.

Chapter 16
E-Health Communities for Learning Healthy Habits: How to Consider Quality and Usability
Asa Smedberg, Stockholm University, Sweden
This chapter asserts that e-health communities can assist in maintaining a healthier life-style through ongoing interactions between community members. She presents a framework to evaluate e-health communities from a learning perspective, which covers different types of conversation topics, ways to respond and community awareness.

Chapter 17
Standards in Telemedicine ................................................................. 220
   O. Ferrer-Roca, University of La Laguna, Spain

This chapter expects a new era for Telemedicine after the 2009 Prague Declaration. However, she argues that there are barriers, which include literacy, standard connectivity and quality control. Therefore, she addresses literacy regarding the type of standards in each topic of the Telemedicine Body of Knowledge.

Chapter 18
Standards and Guidelines Development in The American Telemedicine Association ............... 244
   Elizabeth A. Krupinski, University of Arizona, USA
   Nina Antoniotti, Marshfield Clinic Telehealth Network, USA
   Anne Burdick, University of Miami Miller School of Medicine, USA

This chapter reviews the mission of the American Telemedicine Association Standards and Guidelines Committee, and the process by which standards and guidelines documents are produced. They also report on the committee’s progress in providing the telehealth community with standards and guidelines for the practicing medicine at a distance.

Chapter 19
Telepaediatrics in Queensland: Evidence for Quality, Reliability and Sustainability .............. 253
   Sisira Edirippulige, The University of Queensland, Australia
   Anthony C. Smith, The University of Queensland, Australia

The chapter challenges the evidence on quality and reliability of telemedicine techniques. They describe the telepaediatric service in Queensland, Australia outlining some evidence for quality, reliability and sustainability.

Chapter 20
Evaluation Considerations for E-Health Systems ............................................. 263
   Anastasia N. Kastania, Biomedical Research Foundation of the Academy of Athens, Greece & Athens University of Economics and Business, Greece

The chapter reviews the reasons for the evaluation of e-health systems, the methods for designing an e-health evaluation and the main points that represent a successful evaluation procedure. She conducts an extensive literature search to encapsulate the dimensions of e-health quality assurance, and provide a conceptual framework for quality and reliability assessment.
Chapter 21
Quality Issues in Personalized E-Health, Mobile Health and E-Health Grids ................................. 278
Anastasia N. Kastania, Biomedical Research Foundation of the Academy of Athens, Greece & Athens University of Economics and Business, Greece
Sophia Kossida, Biomedical Research Foundation of the Academy of Athens, Greece

This chapter realizes the potential of patient information management and medical decision support in an open and mobile medical environment. Therefore, they present an overview of personalized, mobile and Grid applications as well as evidence on quality issues of these fields. They conclude that the success of the information technology allows the biomedical researchers to capitalize in an eclectic selection of tools for resource allocation as well as ubiquitous and transparent distributed systems.

Chapter 22
E-Health as the Realm of Healthcare Quality: A Mental Image of the Future ................................. 291
Anastasius Moumizoglou, Hellenic Society for Quality & Safety in Healthcare & European Society for Quality in Healthcare Executive Board Member, Greece

This chapter sketches a mental image of the future healthcare. He argues that the advancement of e-health in healthcare derives large quality and patient safety benefits.

Compilation of References .................................................................................................................. 311

About the Contributors .......................................................................................................................... 359

Index ..................................................................................................................................................... 369