

## Chapter 19

# Electronic Environments for Integrated Care Management: Case of Depression Treatment

**Matic Meglič**  
*UP PINT, Slovenia*

**Andrej Brodnik**  
*UP PINT, Slovenia*

### ABSTRACT

*This chapter provides a basic overview of care process management and active patient engagement principles. It builds upon these principles to describe in more detail the way information and communication technology can provide support for them. It later discusses their impact on quality and cost-efficiency of care. The authors specify care models suitable for ICT support, specific process support characteristics related to health care, standards and communication devices that are being used. The chapter also provides a description of development and implementation of such an environment to support treatment of patients with depression.*

### INTRODUCTION

Information and communication technology (ICT) offers to the health care systems a new and ever expanding horizon of possibilities to reshape and transform existing health care services as well as implement new, so called eHealth services that were unthinkable of just 10 years ago. Care process management, active patient involvement (so called patient empowerment) and remote care are some of the components of care benefiting most from innovations in eHealth. These components are

important not only in improving long-term health-care but also in sustaining or decreasing financial burden as long-term care is using increasingly more financial and human resources in health care in developed countries. The goal of this chapter is to offer to the reader an insight into some of the challenges the health care systems are facing and describe the way eHealth is helping to support care process management, active patient engagement and remote care. The technologies we focus on include process support, internet and IP multimedia subsystems (IMS). The objectives of this chapter are: to describe modern approaches to health care organization and active patient engagement; to explain

DOI: 10.4018/978-1-61520-777-0.ch019

how these modern approaches can be supported by some of the information and communication technologies of today; to provide a case description of an existing environment to support treatment of patients with depression; and to discuss impact on cost of care, quality, and future trends. In the following section we describe some of the general trends and issues in health care and some specific issues that ICT can solve. The section is followed by a description of different models of health care organization. In section 'ICT support for care management and active patient engagement' we present three components of ICT support for these models and then apply the findings to a specific case of depression treatment. In the case description we focus on depression treatment issues, state of the art in ICT support in depression treatment, methods used in the study, preliminary results and the problems we faced in designing, developing and implementing the depression treatment support environment.

We conclude the chapter with some of the future research directions.

## **BACKGROUND**

Health care in the developed world is facing a combination of changes that forces the health care systems to rethink the principles of care provision and to reinvent themselves especially in terms of cost-efficiency, access to care, and quality of care (Bloom, 2002).

The changes on the horizon are on one side a growing population of elderly combined with an increasingly growing numbers of chronically ill patients and patients with one or more chronic conditions - such as hypertension, diabetes mellitus, depression, obesity, asthma, and chronic obstructive pulmonary disease. On the other side is a powerful drive of the health care and pharmaceutical industry to introduce more advanced treatments and procedures, sell more expensive drugs and lower the threshold of diagnosis and

consequent earlier treatment initiation (as has been seen in hyperlipidemia with lipid-lowering drugs).

Combining the two trends – demographic changes and ever present industry interest – we can foresee a further need and drive for increase in the scope and extent of health services to be provided. The increase in scope is almost invariably combined with an increase in cost. This poses a threat to cost-sustainability of health care systems as the costs are already spiraling upwards (Bodenheimer, 2005a; Bodenheimer, 2005b; Marmor, Oberlander & White, 2009). There are several measures to prevent the uncontrolled increase of system - level health care cost. Most of them are restrictive in nature and are focused on readjusting the extent of services provided within the public health care, introducing co-payments and concomitant new insurance schemes, often reducing the availability of services (Bodenheimer, 2005c; Marmor et al., 2009).

Besides these measures a change of thinking is needed for health care systems to provide accessible and affordable future care to the growing population of patients with long-term conditions (Wilson, Bunn & Morgan, 2009). Some of the aspects of needed changes are described in more detail below.

Looking at the cost we can say that the more specialized and institutionalized the care, the more expensive it is. Emergency hospital care and subsequent rehabilitation and consecutive life-long drug therapy due to a myocardial infarction are much more expensive than primary or secondary preventive activities organized by a general physician (Bennett et al., 2008; Jovicic, Holroyd-Leduc & Straus, 2006). These preemptive (or preventive as they are called) activities usually involve the patient to a greater extent and place a part of the prevention process on patient's shoulders. The costs of the patient performing preventive activities at home to the health care system are second to none besides education and motivation. We can argue that the patient him- or

20 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:

[www.igi-global.com/chapter/electronic-environments-integrated-care-management/42943](http://www.igi-global.com/chapter/electronic-environments-integrated-care-management/42943)

## Related Content

---

### Up-Converting Nanoparticles: Promising Markers for Biomedical Applications

Livia Petrescu, Speranta Avram, Maria Mernea and Dan Florin Mihailescu (2018). *Biomedical Engineering: Concepts, Methodologies, Tools, and Applications* (pp. 278-311).

[www.irma-international.org/chapter/up-converting-nanoparticles/186681](http://www.irma-international.org/chapter/up-converting-nanoparticles/186681)

### Approach Towards Non-Invasive Blood Type Method by Studying Optical Properties of RBC Using Double Beam Spectroscopy

Rishi Nailesh Patel, Makvana Mohit Vallabhdas, Safina Sahil Suratwala, Himanshu A. Patel and Palak Parikh (2021). *International Journal of Biomedical and Clinical Engineering* (pp. 35-49).

[www.irma-international.org/article/approach-towards-non-invasive-blood-type-method-by-studying-optical-properties-of-rbc-using-double-beam-spectroscopy/272061](http://www.irma-international.org/article/approach-towards-non-invasive-blood-type-method-by-studying-optical-properties-of-rbc-using-double-beam-spectroscopy/272061)

### Biomedical Applications of Gold Nanoparticles: Recent Advances and Future Prospects

Irshad Ahmad Wani (2018). *Biomedical Engineering: Concepts, Methodologies, Tools, and Applications* (pp. 837-858).

[www.irma-international.org/chapter/biomedical-applications-of-gold-nanoparticles/186709](http://www.irma-international.org/chapter/biomedical-applications-of-gold-nanoparticles/186709)

### Data Mining Medical Digital Libraries

Colleen Cunningham (2009). *Medical Informatics: Concepts, Methodologies, Tools, and Applications* (pp. 334-340).

[www.irma-international.org/chapter/data-mining-medical-digital-libraries/26227](http://www.irma-international.org/chapter/data-mining-medical-digital-libraries/26227)

### Classification of Breast Thermograms Using Statistical Moments and Entropy Features with Probabilistic Neural Networks

Natarajan Sriraam, Leema Murali, Amoolya Girish, Manjunath Sirur, Sushmitha Srinivas, Prabha Ravi, B. Venkataraman, M. Menaka, A. Shenbagavalli and Josephine Jeyanathan (2017). *International Journal of Biomedical and Clinical Engineering* (pp. 18-32).

[www.irma-international.org/article/classification-of-breast-thermograms-using-statistical-moments-and-entropy-features-with-probabilistic-neural-networks/189118](http://www.irma-international.org/article/classification-of-breast-thermograms-using-statistical-moments-and-entropy-features-with-probabilistic-neural-networks/189118)