

# Identifying Critical Changes in Adoption of Personalized Medicine (PM) in Healthcare Management

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## ABSTRACT

Among the emerging areas in health-care system, the implementation of Electronic Medical Record system and the discovery of Personalized Medicine are occupying top positions. While some of the personalized drugs have already been discovered, implementing this new medicare system requires a lot of changes in the traditional health-care system. This paper aims at identifying these critical changes required in the adoption of the Personalized Medicine system. A systemic attempt has been made to prepare a list of possible changes required for the adoption based on available literature. This research study shows that changes from reactive to efficient medical care, from trial and error to right treatment for right person at right time, from narrow mind-set to open mindedness, from open information of patients to secure information, from less emphasis on IT infrastructure to more emphasis on IT infrastructure are some of the significant changes that are necessary for implementing the revolutionary medicare system of personalized Medicine.

## KEYWORDS

Change Management, EMR, Personalized Medicine, Statistical Analysis, T-Test

## 1. INTRODUCTION

Personalized Medicine, also called precision medicine, is an emerging revolutionary medicare system that bears the potential to take care of the needs, characteristics and preferences of individual patients. This Medicare system is supposed to take care of the patient, not only during his/her diagnosis and treatment of the disease, but also the follow-up action and the prevention of disease. In the Personalized Medicare system, there exist bright prospects of a priori categorization of a group of patients for all of whom the same treatment procedure will work. Thus in this new mode of clinical treatment is embedded the possibility of drastic reduction of expenditure of medicines as well as medicinal side effects.

The concept of Personalized Medicine is a new kind of clinical practice for having a better understanding of patients' condition by predisposing a disease (NHMRC, 2011, Ginsburg and McCarthy, 2001, Ong et al., 2013). It intends to accomplish ideal restorative results to help doctors and patients choose better treatment approaches after knowing the genomic profile of the patient. Such methodologies may incorporate genomic screening programs which help the physician select

the most suitable type of the medicine and its dose for a given patients' group by diagnosing different types and sub-types of the disease (PMC, 2014).

Individuals vary from one another in various ways, e.g. their eating habits, mental anxiety and stress, exposure to ecological elements, and through their DNA. Their health/pathology can be affected due to these factors. Differences in genomic groups could enhance the risk of developing certain diseases, and the extent to which it advances. These variations of genomes also effect in the reaction of our body against a particular drug. Medical statistics reveal that in the conventional medicare system, for 40% patients asthma drugs are ineffective, diabetic drugs for 43% and anti-depression medicines for 38%. The rate of ineffectiveness may rise up to 75% for cancer patients (<http://genetichealth.jax.org/personalisedmedicine/what-is/benefits.html>). Personalized medicare systems expected hopes to develop new safe and effective treatments taking genomic variations of patients into account. Personalized medicare may incorporate the administration of drug therapy along with recommendations for lifestyle changes. This may cause reduction in the proneness of a particular disease also bring about a reduction in its impact.

Several changes are required to incorporate this new evolutionary medicare system. The general objective of the paper is to enhance the possibility of the implementation of the emerging Personalized Medicine framework. Specifically, an attempt has been made to address the research question: What are the critical changes required for the successful adoption of Personalized Medicine system in healthcare management? The paper is organized as follows. In Section 2, a review of the background, including discussion on related research of earlier researchers has been presented. The motivation of the present work is also mentioned in this Section. In section 3, we identified and developed a model for the critical changes required for successful implementation of PM. In Section 4, we have presented our research methodology. An appropriate discussion of the results of our statistical analysis is included in section 5. Finally, in Section 6, some conclusions based on the present study are drawn and some directions for future research have been suggested.

## 2. BACKGROUND AND MOTIVATION

Personalized Medicine (PM) is a newly emerging concept in the healthcare sector. Some of the personalized drugs have been already discovered by the researchers. But adoption of the Personalized Medicine concept still lags researches. Although there are a few researches on the genomic interpretation and genetic prediction (viz. Esvelt & Wang, 2012, Mali et al., 2013, Cong et al., 2013, Zamft et al., 2012, Dreyfuss, 2012), progress of research on different aspects of personalized healthcare is quite inadequate. Bolouri (2010) has discussed some issues related to personalized healthcare somewhat elaborately. In the domain of e-health, Eysenbach (2001) and Ahern et al. (2006) published some important articles. Jadad et al.'s (2005) review and Eysenbach and Diepgen's (2001) discussion on the electronic healthcare system give useful direction towards adoption of this new medicare system. Ruggiero et al. (2012) dwelt on the utilization of irregular digit-dial recruitment as a conceivable method for randomized controlled trial of an Internet- based mediation. The security issues of e-mental health were discussed by Bennett et al. (2010). Andrews and Titov (2010) discussed the points of interest and drawbacks of e-mental health. Although these studies lead to the discovery of Personalized Medicine concepts, no significant literature is available on the adoption of Personalized Medicine systems and their impact. Misra and Bisui (2014) recently explored the critical challenges for the adoption of Personalized Medicine system in the healthcare management. The authors also put forward systematic and elaborate discussion on several important aspects of Personalized Medicare system in this paper. In the same scholarly article, the authors have dwelt on a number of issues that offer hindrance to the implementation of this scientific mode of clinical treatment. Misra and Bisui (2015) have also researched the feasibility of Personalized Medicine adoption. They have shown that in the given scenario it is quite difficult to adopt Personalized Medicine successfully. Hwang et al. (2012) have shown that developing countries are trying to adopt Personalized Medicine and EMR

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