Chapter 7
Gamification in Rehabilitation: Finding the “Just-Right-Challenge”

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ABSTRACT

Rehabilitation is complex. It involves an ever-changing interaction of the rehabilitation patient with different clinical environments and healthcare providers. Gamification for rehabilitation goes beyond simply creating a “fun” and “exciting” application or environment in which to complete rehabilitation exercises and interventions. A delicate balance of the demands of the task and the patient’s abilities must be achieved. High-cost and commercially available systems are limited in their applications to gamification for rehabilitation. Furthermore, the created game and system must be usable across treatment settings and at different phases in the recovery process. Insurance companies are also requiring more data from rehabilitation therapists and therapists have minimal time to be able to learn and use a game. Pairing low-cost devices with customized games will allow for better “fit” with each patient, provide appropriate data to therapists and insurance companies, and eventually lead to effective games for rehabilitation.

INTRODUCTION

Healthcare, and specifically rehabilitation, entails complex interactions between multiple persons (doctor, patient, caregiver), multiple settings (hospitals, clinics, the home), and varying stages of diseases (preventive, acute, chronic). The rehabilitation therapist (occupational, physical, and speech) must take the patient’s medical history, current diagnosis, social support, insurance coverage, and a myriad of other factors into consideration when determining the plan of care. “Client-centered care” has been the backbone of therapy professions for decades and the concept is becoming more common in medicine and nursing. The idea of individualized medicine and patients taking a more active role in their health care is critical to rehabilitation. The sense of autonomy, or the capacity to make an informed decision, lies not only as a moral obligation in healthcare, but a driving force of a sound game (Sheldon & Filak, 2008). Gamification of rehabilitation means capitalizing on the concept of autonomy, as well as other aspects of engagement and mo-
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tivation. This chapter is structured into four sections. The first section will provide Background literature and definitions to guide the discussion of gamification in rehabilitation. Building on the literature, the second section will present various issues, controversies and problems surrounding the current state of gamification in rehabilitation healthcare. The third section will provide a discussion of potential solutions to the barriers and issues in the field. The fourth section and final section will build on the solution and provide specific recommendations for healthcare providers, rehabilitation healthcare services consumers, and game designers/programmers/engineers. The objectives of the chapter are to:

1. Review of the current state of gamification in rehabilitation healthcare.
2. Define common terminology used in the fields of rehabilitation healthcare and game design/learning and discuss concepts that support gamification in rehabilitation healthcare.
3. Discuss the challenges and limitations of gamification in rehabilitation healthcare.
4. Explore future opportunities for gamification in rehabilitation, including recommendations for healthcare providers, rehabilitation consumers, and game designers/programmers/engineers.

BACKGROUND

Rehabilitation: Concepts and Definitions

Rehabilitation, as defined by the Centers for Medicare & Medicaid Services (CMS) is “remedial services recommended by a physician or other licensed practitioner of the healing arts, within the scope of his or her practice under State law, for maximum reduction of physical or mental disability and restoration of a recipient to his best possible functional level” (Centers for Medicare & Medicaid Services, 2005). The passage of the Affordable Care Act in 2012 included coverage for habilitation services within Medicaid, separate from rehabilitation services. Habilitation includes “services and devices provided for a person to prevent deterioration or attain or maintain a skill or function never learned or acquired due to a disabling condition” (Centers for Medicare & Medicaid, 2005). Following an injury or illness, a medical provider may prescribe or recommend rehabilitation or habilitation services to help their patients return to the highest possible level of function. Rehabilitation and habilitation services can be provided in a variety of treatment settings ranging from an acute care hospital to community-based programs. Figure 1 details a typical flow of treatment including the various points of entry.

The most common pathway begins with a new injury/illness. If the injury/illness is more severe or dire, the patient will present to an emergency room or urgent care clinic. If the physician decides to admit the patient, they will enter the flow of treatment starting in an acute care hospital. Depending on the severity and recovery period, the patient may need intensive rehabilitation in an inpatient/acute rehabilitation facility. Other times, the patient will be discharged home and potentially receive home health rehabilitation or outpatient rehabilitation. Follow up beyond home health/outpatient rehabilitation typically happens in community programs or with a primary care physician. Consultations in a primary care facility can also be another route of entry. For less urgent matters, a physician may prescribe outpatient rehabilitation. Other times, the physician may choose to admit the patient to an inpatient/acute rehabilitation facility for more intense rehabilitation services (3 hours/day). Some of these facilities have special relationships with Physical Medicine and Rehabilitation physicians and allow them to directly admit their patients from ambulatory clinics. Patients can encounter rehabilitation providers at multiple points in their care for a single illness or injury. Unfortunately,