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KidsETransplant: A Platform for Liver-Transplanted Children

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Abstract

Since 1989, all pediatric liver transplants in Switzerland are centralized at the University Hospitals of Geneva (HUG). Approximately 125 children have received transplants since then, and their survival rate is greater than 90% - one of the highest in Europe. Maximizing the chances of success requires that patients understand and comply with follow-up treatment. The KidsETransplant project aims at helping the child - and his family - to better understand his health situation, to have access to shared resources and to be able to better communicate with healthcare professionals and other patients.

Keywords:
Child, Liver transplant, Compliance, Web, Serious games

Introduction

Understanding of the disease and compliance with follow-up treatment are especially important in order to maximize outcomes after liver transplantation. In order to avoid complications, such as graft rejection, patients must take medications regularly and lifelong. However, children, especially around 10 to 15 years-old, are less likely to follow the heavy constraints of the treatment. Tools for enabling them to better understand the issues related to treatment are, therefore, welcome, and serious games have been shown to increase understanding of diseases and treatments in various situations [1].

Methods

A multidisciplinary working group composed of clinicians closely implicated in the care of these patients, computer scientists and media experts designed and implemented the KidsETransplant platform [2]. Patients and their parents were also invited to give their comments as they will be the principal users of the platform.

The platform has 3 components:

1. A website providing reliable medical and practical information. It contains general information about liver diseases, treatments, care process, and healing, among other topics.
2. An interactive discussion forum for the patients and families followed at HUG. It will permit exchanges and dialogue among the children and their parents.
3. A mobile application to access electronic medical records.

The mobile application aims to be *the* personal interface for the child and his family. The main target group is the children themselves so it must be attractive, resembling the media and toys they like to use. It is on this platform that the child will find information on his health status, his medications, and future appointments. In order to appeal to the kids and maximize utilization, a classical web-based application was abandoned in favor of a "serious games" approach close to what children are using on various game consoles. This makes development of convivial and attractive user interfaces possible.

The basic idea of the interface is that the child navigates in his own virtual room. Objects are placed in natural locations: clicking on the objects triggers actions like "open the diary", "look at lab results", etc.

The interface displays information from the child's own medical record, such as laboratory results, exact medication plan, or date of next visit. In the medication summary page, the child can add reminders to take his drugs, and be notified by SMS if he wishes. Such a facility will be very useful as the medication plan is quite complex and varies according to treatment plan.

Access to the room is of course protected by strong authentication. The same mechanism is used as for the Web platform.

Results

Preliminary feed-back on the mobile platform has been enthusiastic with the children willing to use it as soon as possible.

Planned improvements to the platform will include the addition of pop-up text boxes associated with particular objects in the child's virtual room, and quizzes to add another level of challenge to the patient's gaming experience while helping the clinical team track patient understanding of his therapy.

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