CONFERENCE ABSTRACT

Better glucose regulation through enabling group-based motivational mechanisms in cloud-based solutions like Nightscout

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Dani Beckman[2], Christian Marstrander Reehorst[2], Andre Henriksen[2], Miroslav Muzny[1], Eirik Årsand[1,3], Gunnar Hartvigsen[1,2]

1: Norwegian Centre for E-health Research, University Hospital of North Norway (UNN), Tromsø, Norway
2: Dept. of Computer Science, University of Tromsø – The Arctic University of Norway, Tromsø, Norway
3: Dept. of Clinical Medicine, University of Tromsø – The Arctic University of Norway, Tromsø, Norway
Correspondence to: Gunnar Hartvigsen, T +47-90657795; gunnar.hartvigsen@telemed.no

Introduction: The Nightscout project (represented under the name "CGM in the Cloud" at Facebook and other sources) [1] is an open source, DIY (Do It Yourself) initiative that permits real time access to CGM (Continuous Glucose Monitor) data through personal website and smartwatch and smartphones apps. Nightscout was started by parents of children with Type 1 Diabetes and has continued to be developed, maintained, and supported by volunteers. The goal of the Nightscout project is to allow flexible, remote monitoring of a person with type 1 Diabetes' glucose level using existing monitoring devices. Few solutions offer multi-user functionality to share blood glucose (BG) data and work together to achieve healthy glucose control. The typical user interfaces present the current BG value and the historical development of the user's BG values for one single user only.

It is a general problem that patients with chronic diseases tend to loose motivation to manage it properly over time. One approach to meet this challenge is to establish a small user group where the members monitor and encourage each other, to optimize glucose control, and where reward mechanisms are used to enforce motivation and competitions.

Methods: In this student project, we have studied motivational mechanisms that can inspire small group of people with diabetes to better manage their disease, and specifically their glucose control through getting access to each other's data. We propose how to extend the Nightscout application with motivational mechanisms and social media functionality for small user groups.

Results: The following motivational mechanisms have been proposed:

Group motivation: Through constantly being compared with the other group members' blood glucose level in multiple graphs, status icons, arrows indication range and development, etc., we will create a community feeling and responsibility for the group. Instead of competing internally in the group, the group can act as whole and compete with other groups about being the best regulated group.

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High score lists: Through including scores for good regulated patients who may challenge each other.

In addition, we consider to use:

Avatars: A funny avatar may be both attractive and supportive for younger users. The avatar might also be used to "poke" friends who need motivation with their regulation.

Gamification: Using elements from computer games may increase motivation and use.

Alarm system: Alarms may be issued in many different forms, including avatars (monsters, smileys, etc.). Alarms in the form of e.g. monsters might be send between group members when they are not doing well.

Discussion: Nightscout is a project initiated and performed by computer-skilled parents with children with type 1 diabetes, parents who are not willing to wait to get access to technologies that can enhance their children's health. The software has been developed by several people with the same goal – get better solutions, and get them fast. As a consequence, the source code repository and code quality does not have industrial qualities. Therefore, even though the code is freely accessible, it is challenging for programmers outside the core development team to extend this kind of source code.

References:

[1] Nightscout, 2016. Available from: http://www.nightscout.info.