Virtual patients and other virtual environments for learning, assessment, diagnosis and treatment

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Various types of computer-based simulated patient cases have been developed and introduced in medical and healthcare education during the last 10-15 years. Most of these have been aiming for learning and training various skills and have been used in preclinical, clinical and graduate education. Today, the common term for these kinds of learning systems is Virtual Patients, or VP for short. Virtual Patient applications have been found to best suit learning and training Clinical Reasoning, which can be described as clinical problem solving or clinical decision making. But such cases can also be used for self-evaluation, assessment and also for other tasks.

There are a number of Virtual Patient systems available, but most of them have common features like interactive illness history taking, physical examination, lab/imaging tests, diagnosis and therapy suggestions. Most systems also have a feedback section where the user automatically may receive information about his/her performance and which tasks that were performed good/less good. A number of these systems exist in different languages and have been implemented in various courses around the world. Many VP systems have been focused on only specific medical areas and course set-ups like surgery, radiology or preclinical physiology, but there are also more generic ones, by means of which the teacher or course director can create and edit his/her own cases. Further on, VPs can be used for not only medical education, but also in nursing, dentistry, physiotherapy and similar programs.

Today, there are many scientific studies published describing increased motivation and engagement of students as well as of comparisons with more traditional learning materials when using VPs. However, few studies have focused on learning outcomes, the use of VPs for assessment and the use of Virtual scenarios and cases for also diagnosing and treatment of (real) patients.

In this presentation, a number of Virtual Patient systems developed by the Virtual Patient lab at Karolinska Institutet in Sweden will be presented, demonstrated and discussed. These include Interactive Simulation of Patients (ISP), Web-based Simulation of Patients (Web-SP) and national Educational program for Dermatology and Venereology (Nudov). Experiences from implementation in different settings, student opinions as well as teachers' views will be presented. Examples of Virtual patient applications for Assessment will also be shown and discussed, together with relevant literature references. Recommendations regarding implementation strategies, development of cases and methods for international exchange of cases will be discussed.

Finally, a new possible use for virtual cases and scenarios for diagnosing, risk-estimation and rehabilitation of patients and clients within psychiatry and criminal (prison) care will be demonstrated and discussed. This system, Reactions on Display (RoD) is also intended for use in rehabilitation of men sentenced to prison for domestic abuse.