Training Scenarios for Vascular Surgeons of Peripheral Arteries

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The aim of this work is to present the structure of the clinical scenarios which constitutes the core of the real time simulation for safer vascular stenting (RT3S) training application. The RT3S training application is designed in order the tutors (expert surgeons) to easily prepare the educational content for their students and the students (future surgeons) to be trained on the assessment of real patient data, the decision making process on the management and treatment of a patient. It is an e-learning application which uses state-of-art technologies, such as Learning Activity Manager System (LAMS) (1), for the implementation of the training process and it is based on latest e-learning standards, such as IMS Learning Design (2), for the implementation of the training scenarios.

The general flow of the training scenarios is depicted in Figure 1. The scenarios start with the learning objectives and the benefits for the trainee in order to trigger his/her interest. The trainee then accesses all the patient related information, which according to the expert is needed in order the trainee to make an initial assessment for the patient condition. Feedback of the expert is provided to the trainee helping him/her to avoid mistakes in the following steps. Based on the above information the trainee is prompted to suggest a treatment plan depending on the level of his/her experience (e.g. Level 1 medical resident, Level 2 medical student). The trainee compares his/her suggesting with the one provided by the expert. In the next step the imaging examinations are presented. The trainee has the possibility to generate the 3D model of the artery and then select and place the endovascular materials to a specific position on the artery. The calculated fatigue fracture risk is provided to the trainee. By combining the imaging examination with fatigue fracture risk assessment results the trainee proposes the final treatment for the patient. Depending on the treatment proposed by the trainee, the expert provides the corresponding feedback. The trainee completes the angioplasty report and compares it with the one completed by the expert. The scenario closes with an evaluation of the trainee based on the answers provided during the scenario.

The training scenarios are represented as a flow of tasks plus data from one stage to another in a way that is governed by rules or procedures for peripheral vascular angioplasty. The key characteristics of the scenarios are the following: a) can be easily adapted to the educational objectives and the needs of each trainee, b) allow students to evaluate patient related information (medical background, medication, lab tests, imaging examination etc.) and then suggest management and treatment approaches for the patient, c) allow students to identify, at each stage, critical pathways in clinical procedures and respective outputs e.g., risk factors, possible affects, and complications, d) permit simulation of interventions and thus, help trainees to make better decision before undertaking practical cases and e) allow trainees to identify constraints for each pathway on tissues, plaques around, morphology of vessel (geometry), relevant movements, deformations, mechanical properties of stents.

References

1. LAMS: Learning Activity Management System [Internet]. Available from: http://www.lamsinternational.com/.

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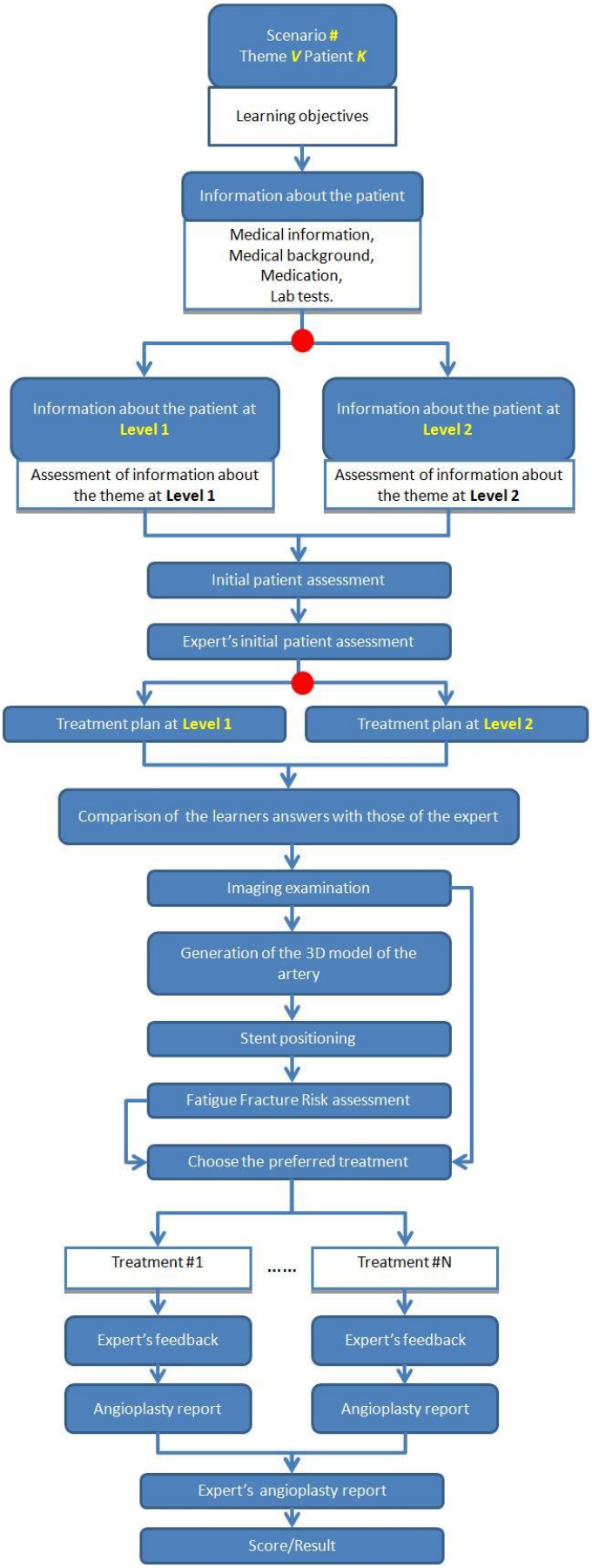

Figure 1: Training scenario flow.