

"QualiTEE" - AN INTELLIGENT GUIDANCE AND DIAGNOSIS SYSTEM FOR THE DOCUMENTATION OF TRANSESOPHAGEAL ECHOCARDIOGRAPHY EXAMINATIONS

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Introduction. The intraoperative monitoring of critical ill patients is a permanent challenge in modern anaesthesia. The use of transesophageal echocardiography (TEE) is a well established method in monitoring these patients. But besides the understanding of the technical aspects, the results of a TEE examination can be improved, if the exam is done in a correct and efficient way.

Methods. The "QualiTEE" project is a cooperation of the Department of Anaesthesiology of the University of Wuerzburg Hospitals and the Department of Artificial Intelligence and Applied Computer Sciences of the University of Wuerzburg. The major goal of this project is the development of a knowledge system supporting the anaesthesiologist when performing a TEE examination. Major aspects of the "QualiTEE" project are:

Quality assurance by using a standardized examination protocol: The system is proposing and guiding the documentation process by presenting the user a standardized documentation giving choice of practical, useful and relevant questions and alternatives. The dialog structure of the documentation process can be led by the system („guided dialog“) or the user („free dialog“). The standardized, guided examination protocol enables even the beginners to take a high-quality examination and documentation.

Automatic inference of conclusions, e.g. diagnoses: The diagnostic module of the system will be able to derive abstractions based on the gathered examination results. The system will recommend diagnoses, e.g. valvular defects, heart sufficiency, based on the findings of the examination.

Automatic generation of medical reports using templates: The system will be able to publish the results and diagnoses in tabular form or as a medical report by using preformatted text templates. An integration to enterprise software e.g. SAP/R3 is planned in the future to save the gathered data in an electronic patient's file.

Further use of data: All gathered results can be collected in a case database. It is possible to evaluate the database systematically and retrospectively by using data-mining methods. Different examinations of the same patient can also be evaluated by setting the results in a time dependent context.

Tutor system extension: The knowledge system together with the database can also be utilized for problem based learning. For this purpose the system is performing a step-by-step presentation of a case and the learner will be able to describe the findings using sample material and derive consecutive interpretations, i.e. diagnoses and therapies.

Conclusion and Outlook. The "QualiTEE"-system will be able to help and support the anaesthesiologist during the TEE examination and learning the examination techniques. In addition to the usage as a documentation system for results in the OR or the ICU, the system will also be able to perform sophisticated methods of data evaluation and will also offer the possibility using the gathered database for problem based learning.

First clinical testings of "QualiTEE" are in design and will deliver first results about the systems validity and the users acceptance.