

Human Performance Evaluating of Advanced Cardiac Life Support Procedure Using Fault Tree and Bayesian Network

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Abstract : In this paper, a hybrid method based on the fault tree analysis (FTA) and Bayesian networks (BNs) are employed to evaluate the team performance quality of advanced cardiac life support (ACLS) procedures in emergency department. According to American Heart Association (AHA) guidelines, a category relying on staff action leading to clinical incidents and also some discussions with emergency medicine experts, a fault tree model for ACLS procedure is obtained based on the human performance. The obtained FTA model is converted into BNs, and some different scenarios are defined to demonstrate the efficiency and flexibility of the presented model of BNs. Also, a sensitivity analysis is conducted to indicate the effects of team leader presence and uncertainty knowledge of experts on the quality of ACLS. The proposed model based on BNs shows that how the results of risk analysis can be closed to reality comparing to the obtained results based on only FTA in medical procedures.

Keywords : advanced cardiac life support, fault tree analysis, Bayesian belief networks, human performance, healthcare systems

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