

FMECA Framework for Ranking DS Tests

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Today, responsible healthcare management is always customer focused. To be successful, this orientation requires cooperation between the medical system and the patient. This situation means that the patient must be provided with an explicit explanation regarding the risk analysis of his or her condition and the existing options for improving, ameliorating, stabilizing or remedying it.

We analyzed the problem of risk analysis in testing pregnant women at risk of carrying a Downs Syndrome fetus. In most cases, the main criterion in the decision about which detection method to be used is the patient's medical condition. The authors developed a novel approach that takes into account the prior statistical medical information, testing errors rates, and losses due to faulty decisions. In the case of Downs Syndrome fetus detection, the loss incurred when aborting a healthy fetus and the loss related to delivery of a Downs Syndrome baby are influenced by factors related to the family's/mother's social situation, i.e. economic level, the number of children, religious and cultural values. The analytical hierarchy process (AHP) method is used for scaling the subjective scores of the above mentioned losses. A case study demonstrates an application of the model developed.