

SPECIAL PAPER

Medical Imaging Devices Assessment at Public Health Sector of Greece. Risk-Based Maintenance: A Decision Support Model

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Abstract

Introduction: Medical imaging equipment such as ultrasound, X-ray, Computed Tomography and Magnetic Resonance Imaging systems are essential in modern hospital operation. They have the capacity to promote public health under the condition that they operate with high reliability and safety requirements.

Aim: The aforementioned prerequisites necessitate an efficient maintenance planning that could keep these devices in good condition at the minimum cost. The rare economic resources in Greece due to the recession have made this task rather difficult.

Methodology: A risk-based decision support model is introduced in this study towards the debate whether to maintain or not a medical imaging device. Several parameters and metrics have been utilized as input in the decision algorithm in order to produce optimum decision regarding the need to maintain a certain device. These include availability, key performance indicators, risk and economic factors. These metrics are capable of capturing all the information that is significant for each medical imaging device.

Results: A case study has been made in this study that utilized an x-ray imaging C-arm towards efficient decision making regarding maintenance that employed all the metrics of the last two years where the C-arm imaging device is without a preventive maintenance contract with the manufacturer.

Conclusions: The decision model introduced in this study could be of value for the hospital management and provide important information regarding the condition of each medical imaging device and possible future failures.

Keywords Medical Imaging Devices, risk-based maintenance, decision support system, cost-effectiveness