DIGITAL OPERATING ROOM ASSISTANT – MONITORING SYSTEM FOR OPERATING ROOM DEVICES

ACP Guédon[1], LSGL Wauben[1], M Overvelde[2], JJ van den Dobbelsteen[1]

[1]Department of Biomechanical Engineering, Delft University of Technology, Delft, the Netherlands
[2]Reinier de Graaf Gasthuis, Delft, the Netherlands

Introduction:
The increasing number of new technologies in the operating room (OR) has made the surgical environment more complex, which increases the risk on technical incidents. Missing or malfunctioning equipment often delay the procedure and are a source of incidents during procedures. The aim of this study is to set up a system to monitor the presence and the safety status of OR devices, to alert the staff about irregularities and to simplify the notification of a malfunction.

Methods:
The proposed system was designed to be implemented in an OR complex of a Dutch teaching hospital consisting of four ORs. The tracking technology, developed in collaboration with LogiSense, is based on radio frequency identification technology (RFID). Before the tracking was implemented, the interference of the RFID tags and readers with the OR devices was tested to ensure safety. Moreover, the location of the readers in relation to the floor plan of the OR complex was optimized. Also, a graphical user interface (GUI) was designed for access to the hospital's technical facility management system and to provide feedback on device status to the OR staff.

Results:
For this study, a selection of 100 OR devices was made. The system is able to instantly determine the location and maintenance status of all devices in the OR complex. The developed software environment and GUI provides the opportunity to alert the staff about irregularities and simplifies the notification of a malfunction. The monitoring system is currently being tested for a pilot period of six months. All the malfunction notifications will be saved in the hospital's technical facility management system. The users will be interviewed on their experience of the monitoring system.

Discussion:
In 2011, 121 malfunctions were notified for this OR complex. By automatically monitoring the status of OR devices an increase in registered notifications compared to the previous years is expected. This will provide valuable insight in the frequency of incidents and recurrence of malfunctions of individual devices. On a longer term, such a system is

expected to prevent irregularities and increase the safety related to medical OR devices.