



WIRELESS TECHNOLOGY LEADS TO BETTER, SAFER PATIENT CARE



Case Study
September 2012 -
April 2013

**Wireless
technology**

**Fast overview of the
whole situation
at the MEU**

**Customized
solution**

■ **Electronic Whiteboards in the Medical Emergency Unit at University Medical Center Ljubljana**

The Medical Emergency Unit (MEU) is part of the Division of Internal Medicine at University Medical Center Ljubljana (UMCL). The unit hospitalizes around 25,000 patients each year. Spatial limitations, and an increasing number of patients with complex conditions requiring potentially more demanding care, led to department overload, long treatment times and waiting queues.

Crowded waiting rooms and long wait times at MEU were the most common reason for patient complaints. Meanwhile, independent international research showed a correlation between waiting in emergency departments and complications in later hospital care. MEU management was addressing these issues in order to improve patient care. Part of this effort was the implementation of an electronic whiteboard (EW).

"EW implementation has been, in an organisational sense, pretty challenging. Its main benefits are fast overview of the whole situation and therefore better response to it. I would also stress the alarm option that enables patients to notify the staff immediately in case of emergency. The full range of benefits will be available after we further consolidate our work processes. The solution is technically very good and tailored to our needs and specifics, which were addressed by our partners, NIL Ltd. and List Ltd. We will add on functionalities to the system in the future."

Msc. Hugon Možina, Head of the Medical Emergency Unit at UMCL

Goals: shorter treatment time and increased patient safety

EWs are large electronic screens that display important information about patients (demographical and clinical) and system performance. MEU chose this solution based on international references and the experiences of hospitals from abroad, as well as researching attitudes toward this solution among MEU employees. The EW system provides fast and detailed insight into patient location and treatment status, which contributes significantly to better awareness and consequently fewer mistakes in treatment. The EW system also enables patients to ring an alarm to call for help.

MEU provides the data for EW from two sources: the internal Hipokrat IT system, which existed prior to EW implementation; and the Real-Time Location System (RTLS), which constantly tracks patient location. RTLS works with the help of Radio Frequency Identification (RFID) technology.

RTLS consists of four building blocks: wireless network, wireless tags, location server and ultrasonic location sensor. The wireless network infrastructure was already deployed, but some adjustments were needed to ensure that the EW system would work correctly. The EW system needs very precise information about patient location; therefore, NIL had to rearrange access point positions and add new ones, as well as deploying ultrasonic location sensors.

For computing and location data storage, NIL also deployed a location server in the UMCL data center. The system is centralized and easily scalable, in case other UMCL departments need its resources. In the final deployment phase, NIL integrated the location server with the Hipokrat system, which linked the information about patient treatment status with the patient's current location.

At this point, the EW system became operative. From the patient's point of view, the solution works this way: when accepted into the clinic, the patient is fitted with a wireless RFID wrist tag, which provides the system with the patient's data. The patient wears the tag throughout the treatment procedure. When the treatment is finished, the tag is removed from the patient's wrist.

MEU uses two different types of EWs. The first type is used by staff and displays the following information: arrival time/sorting number, treatment time (difference between arrival time and current time), responsible hospital team, patient's mobility, name and last name, identification number, leading symptom, special notes, status of laboratory examination, status of radiology examination, treatment phase, etc. This information gives the MEU staff a fast overview and insight into specific patient treatment phase, calculations of average treatment times, points of congestion and critical points in treatment.

The second type of EW is meant for patients and their companions, and it provides the following information: arrival time/sorting number, treatment time (difference between arrival time and current time), identification number and treatment phase. This type of EW can also display information about sorting numbers, instructions and standard notifications; for example, in case of a delay for a patient who needs immediate attention.

Future plans

MEU expects positive consequences from the EW implementation, in the clinical, organizational, and administrative areas, as well as from a financial perspective. The greatest benefits are expected in connection with improved staff coordination as well as faster and better patient treatment.

Improved resource utilization

Greater patient safety

Improved situation awareness

Fewer complaints

Better coordination

SOLUTION CHARACTERISTICS:

Wireless network

Wireless RFID tags

Location server

Ultrasonic location sensors

Integration with internal IT system

EW for staff

EW for patients and their companions

Alarm functionality

Over time, the EW system will also provide data that enables setting quality indicators. On the basis of this information, MEU is also planning to develop a simulator for testing the (in)efficiency of proposed reorganizations, and for finding patterns in the work systems. Eventually this data will lead to optimization of work processes and patient treatment. Among MEU's future plans is online access to EW and the development of a mobile application to make communication easier between MEU and other departments.

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