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RFID as a Contribution to Patient Safety

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The aspiration to secure high quality healthcare for the citizens of northern Luxembourg requires taking a proactive approach to tackling the risks associated with hospitalisation. International data on adverse events during hospital stay indicate that the incidence of medical error is so great as to make the integration of patient safety an indispensable requirement for modern hospital management. According to recent studies, taking all inpatient episodes into account, adverse events can be expected in 5% to 10% of cases, patient harm in 2% to 4% of cases, medical error in 1% of cases and death due to medical error in 0.1% of cases. Empirical data in this area is not yet available for Luxembourg. Among the potential adverse events which can result in harm to patients during hospitalisation, the following are the most common:

- events caused by or related to medicines;
- nosocomial infections;
- pressure sores; and
- falls.

RFID as a Risk Management Tool

Against this background, the St. Louis Hospital in Ettelbrück developed and implemented a series of measures as part of a broad risk management strategy. A key feature of this initiative is the innovative application and utilisation of the possibilities afforded by new information and communications technologies. Credit for this is due in part to the hospital's efficient IT unit and in part to an internal culture which fully adheres to the principle of user involvement in all application development. In this context and by way of an example, we propose to outline how RFID has been used in the hospital.

The Use of RFID

Who in the hospital sector is not familiar with the following scenario? A patient suddenly vanishes from a ward and is found either in the hospital building or on the grounds after a thorough search. With a little luck, no harm is done.

"..61 year old patient found dead on the roof of an Austrian hospital..." (Kronen Zeitung Vienna, 6 June 2004)

"Missing patient found dead. He vanished without a trace from his ward in the Vivantes Hospital in Neukölln and was found dead five days later in a plant room at the hospital..."

The St. Louis Hospital is attempting to minimise the risk of incidents such as these by making greater use of RFID technology.

All vulnerable patients will receive a wristband with an RFID tag, either of their own volition, at the request of family members or on the instruction of medical or nursing personnel following consultation with the patient's relatives. Using IT based patient data each chip is programmed with a reader in a matter of seconds and the entire process proceeds on the basis of a defined procedure.

Should a patient leave a ward unaccompanied, an automatic alert can be issued using any one of a range of technologies – nurse paging device, PC, DECT telephone, fixed line telephone and fax. The alert provides details of all patient-specific information that has been pre-approved for release, including a photograph. Now that the WIFI network and RFID infrastructure has been rolled out throughout the hospital, it is possible to pinpoint the whereabouts of the patient inside the hospital building. If he or she leaves the building, a further alert issues to relevant staff. To prevent false alarms – for instance, in cases where patients leave the ward accompanied for tests – members of the patient transport team carry neutralisation tags with an adjustable range. These tags are also available to care staff.

Other Uses

The same principle is at work in the hospital's plans to extend the use of RFID tags to newborn babies. This step, which has been taken at the request of mothers, means an alarm will be activated if a child is removed from a ward by a person other than a parent or an approved member of staff. The same technology will be used to protect and support staff working in isolated or exposed areas. For example, a member of staff who feels threatened or faces a serious emergency that requires assistance to be summoned will be able to alert a specified group of recipients via a wrist-worn security tag. The alert, including the location of the staff member, will appear on the recipients' monitors and assistance will be rapidly dispatched using a designated procedure.

RFID technology will also be applied in other areas of the hospital building to track and identify the location of equipment such as wheelchairs, trolleys and infusion and syringe pumps. This application makes the identification of the precise location of equipment feasible and allows specific information on each device – for example, maintenance intervals – to be integrated in the hospital's centralised programme for the inventory and maintenance of equipment ("Parc Machines").

Conclusion

Using modern information and communications technologies in a responsible manner that protects patients' rights and complies with data protection rules creates new possibilities to enhance patient safety. The experience of the St. Louis Hospital demonstrates that its approach of systematically engaging with users in all application development and maintaining the independence of manufacturers has more than paid off.

Definition

Radio-frequency identification (RFID) is an automatic identification method which stores and remotely retrieves data using devices called RFID tags or transponders. In addition to remote identification and localisation of objects, RFID devices automatically retrieve and store data.

Transponders and tags can be either active or passive. Passive tags are already used in many areas, for example, materials and container management. The read distance of a passive tag is relatively short and the signal is read by means of a procedure known as inductive coupling. Unlike passive tags, active tags have an internal power source and can broadcast signals to the reader. Active tags compatible with the existing network will be used at the St. Louis Hospital.

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