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Tracking & Tracing : A Key Technology For The NHS

The use of electronic tagging is proving its value in helping to keep track of a wide range of items in health care applications. Microchip tags, using Radio Frequency Identification (RFID), are now widely used to identify assets, pharmaceuticals, disposable and reusable medical equipment. Systems that work with RFID provide ways of reducing wastage, saving operating costs, avoiding lost or mislaid equipment and promoting improved staff safety and patient care.

Developments in RFID technology and standards are combining to increase the importance of this technology to NHS by reducing the costs of the technology and significantly improving the range of applications for which it is useful.

This short guide from CoreRFID, specialists in tracking and tracing technologies, outlines the current state of the art and highlights some of the application areas where this technology can be applied.

Connecting For Health is promoting technologies for automatic identification in the NHS.

The Fundamentals of RFID

Radio frequency identification using small electronic transponders that can be attached to items that need to be tracked. These transponders can be read by computer systems to identify the idividual item. Different technologies allow the transponders to be of different sizes and formats (some as small as a grain of rice, others embedded in printed labels or others enclosed in robust housings for use in hostile environments).

Addenbrooke's Hospital uses RFID tags supplied by Core-RFID in order to track security guard patrols.

Different types of the tag mean that some tags need to be read from a distance of only a few centimetres while others can be read from 10's of metres away. Some tags carry small batteries to boost their transmission capability; others use the power induced by the reading device making them independent of battery life. Many types of tags are now subject to international standards so that the costs of implementing RFID is falling dramatically as use of standardised components helps to drive down the prices of tags and readers.

RFID systems allow computer systems to identify things in the world around them; to prompt actions; to validate the suitability of a drug for a patient, to check the identity of an individual that has adminstered a treatment or can simply identify that a particular asset is in a particular location.

Examples of NHS Applications

RFID is well proven. It has been used in NHS applications ranging from asset control to ensuring that patients get the right drugs. Perhaps the simplest and most cost beneficial applications is in the field of asset management. By applying RFID tags to assets, the process of auditing just which assets are where becomes much easier to carry out, allowing more regular checking and providing better information on the usage of assets. RFID asset tracking is particularly useful for high-value, movable assets such as IT equipment and portable / mobile treatment equipment. Recent initiatives by Connecting For Health and standards body for barcodes and RFID GS-1 has provided NHS Trusts with access to coding systems that simplify the introduction of RFID.

The CoreRFID RT100 is a low cost, high performance, reliable, hand-held tag reader that can hold details of up to 1000 tags before transmitting them to a computer.

RFID delivers benefits to the organisation by helping to save costs (either in labour or in saved wastage or fewer assets) or by improving the service provided to parents and carers. One area where tagging is being used is in the control of the supply chain of high value items such as artificial joints where an RFID enabled cabinet of standard items is supplied to the hospital and then replenished by the supplier, automatically as items are used. Equally RFID enabled identification of particular items of equipment can automate the process of monitoring that maintenance or cleaning schedules have been carried out.

Service improvements can range across areas of patient convenience or more importantly in areas of clinical care or infection control. RFID based systems can be used to control ward cleaning, laundry or to manage the collection and recycling of disposables. Hospitals in the Netherlands have trialled RFID tags on blood products which, with a patient tag, help to avoid the danger of administering incorrect transfusions. RFID could also be used to automate the tracking of just which transfusion was used on which patient, reducing administrative costs and improving traceability. NHS trials have shown that using automated identification improved patient checking from 17% of instances to 81%. Similar applications could be anticipated, controlling the exposure of individual patients to radiation over a period of treatment. RFID can be used to track individual items such as prosthetic limbs which when sent for repair can be returned with assurance to their original owner. Or, perhaps more prosaically, RFID can improve security on hospital premises through better patrol monitoring systems.

How Safe Is RFID In Medical Environments?

In 2002 the International Commission on Non-Ionizing Radiation Protection provided advice[1] to the European Commission on the risks to the public of a range of radiation sources, including RFID. This advice was incorporated in an EU Directive[2] to member states in 2004. In summary the advice concluded that, in relation to the frequency and power levels associated with RFID devices that, while there was no indication of any health hazard, "there is a need to collect exposure data about RFID systems". Since then, no further causes for concern regarding radiation associated with RFID used within EU advised limits have arisen.

EU guidance on the risks of RFID says there is no indication of any health hazard.

About CoreRFID

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[1] Possible Health Risks to the General Public from the Use of Security & Similar Devices, ICNIRP, 2002

[2] Directive 2004/40/EC on the minimum health and safety requirements regarding exposure of workers to the risks arising from physical agents (magnetic fields), OJEU, May 2004