Nice University Hospital Tracks All Surgical Diagnosis Samples with RFID

Leading Southern France hospital turns to Frequentiel to improve patient care

"This system will provide excellent tracking of information, including both clinical and pathological data."

— **Paul Hofman,** Biobank Manager at Nice University Hospital

Key facts

- Approximately 57,000 biological samples stored in biobank
- Tags designed to enable 40 years of reliable data retention
- 50% more time saved compared with manual, paper-based tracking method

Nice University Hospital, a multipurpose public healthcare institution located in Nice, France, has been working with the Secured Communicating Solutions (SCS) industry cluster since its creation in 2005. The cluster's aim: to bring innovative technology solutions to the healthcare sector.

This collaboration resulted in the creation of an RFID-based system that enables precise tracking of samples in the hospital's biobank, a cryogenic facility that stores surgical specimens for diagnosis, as well as for clinical and translational research. At any given time, Nice University Hospital has roughly 57,000 biological samples stored in its biobank. Until recently, the facility relied on a manual process that involved attaching paper documentation to all samples. The process was time-consuming, error-prone, and could result in lost samples and compromised security.

In 2010, the hospital, SCS and other partners launched the MISTRALS pilot project to improve patient care by reducing the risk of errors. The goal was to develop a more efficient, accurate and secure way to identify specimens within the biobank, and to track them as they moved from the hospital's pathology laboratory to the biobank.

"A key challenge for the healthcare information systems is certainly the strong requirement for data security associated with an increasing need for confidential data exchange," says Professor Paul Hofman, the hospital's biobank manager and one of the RFID pilot's leaders. "In the MISTRALS project, we aim to address these challenges by ensuring the tracking and timely delivery of biospecimen samples."

Having successfully completed the trial at the end of 2010, hospital officials are now considering a much broader rollout of RFID technology for tracking medical equipment and other items throughout the facility.

Private and Public Sector Collaboration

Nice University Hospital came up with the idea for MISTRALS — which stands for Mutualisation Informatique des Systèmes Technologiques pour la Recherche phArmaceutique et La Santé (or, roughly translated, research on the use of information technology for pharmaceuticals and health) — in response to a call by the French Ministry of Industry to promote RFID technology in healthcare.

Challenges

- Reduce errors in tracking.
- Reduce time taken for tracking processes.
- Develop a more efficient, accurate and secure way to identify specimens within the biobank.

Frequentiel Solution

- OCTO+ item-level RFID software platform.
- Employee facing apps to streamline routine tasks.
- Expert retail, software integration and RFID professional services.
- Device and fixed hardware management services.

Benefits

- Complete reliable tracking of specimens.
- Increased security and confidentiality.
- More time saved.

RFID offers a number of advantages over other tracking technologies, including the lack of a line-of-sight requirement, tags' ability to withstand cryogenic storage and other harsh environments, long read-range capabilities and the ability to track items in real-time.

Project planning started in 2006, spearheaded by the hospital's biobank and overseen by Hofman. A consortium of vendors from SCS — including IBM, Zebra, STMicroelectronics and Tagsys RFID — provided hardware and expertise. IBM developed the overall system, in collaboration with the hospital's IT department.

Frequentiel worked with the hospital's IT department and the vendor partners to integrate RFID hardware with existing IT components including an administrative database.

After conception, the project went through the typical development phases of an engineering project — initiation, planning and design, execution, monitoring and controlling. The system was tested extensively at IBM's Solutions Lab Europe, located in La Gaude, France. The decision to go live was made in December 2009 and the system was launched approximately six months later.

After the system was launched, the Mines Saint-Etienne engineering school analyzed the RFID data's longevity to determine if the information would still be available after several months and/or years of being archived at low temperatures. This was important because the hospital wanted to obtain a sense of how long the data would continue to be available on tags stored at such temperatures. The school's analysis, to date, shows that the information remains present on the RFID tags for up to 12 months, and experiments are still in progress to determine if that amount of time can be extended.

How it Works

In the operating suite, the specimens are placed in individual cryogenic tubes identified with passive high-frequency (HF) 13.56 MHz RFID tags, provided by STMicroelectronics. Each ISO 15693-compliant tag has a 64-bit unique identification number. The tags are designed to provide up to 40 years of data retention and a million read/write cycles. The cryogenic tubes are moved from the operating suite to the hospital's pathology lab via pneumatic tubes — a process that takes less than a minute to complete. After selection by a surgical pathologist, specimens in the cryotubes are weighed and frozen in nitrogen. The tubes are then moved to the biobank, where they are scanned into the hospital's administrative database (via a Tagsys fixed compact RFID station in the biobank) and are then placed into long-term, cold storage on racks.

When technicians or other personnel need to locate particular samples or conduct an inventory of the cryotubes, they can use handheld HF RFID interrogators from Zebra to read the tags.

Early Benefits

The hospital has tagged roughly 1,000 cryogenic tubes to date, and plans to continue tagging biospecimens over the coming months.

"This system will provide excellent tracking of information, including both clinical and pathological data," Hofman says, comparing it with the paper-based process.

For instance, information such as patient name, gender, age, histological results, follow-up visits and treatment can be written to a tag, without any risk of this information being lost. In addition, the process allows individuals working in the biobank to save time when searching for samples, so they can focus on other tasks. The hospital estimates the RFID system provides more than a 50 percent time-savings, compared with the manual, paper-based tracking method.

Another hospital in France, the Paoli-Calmettes Cancer Institute in Marseille, is considering employing the RFID system for tracking surgical specimens. The biobanks in the two hospitals are part of a regional network of tumor banks. With the success of the initial deployment, University Hospital Nice is now evaluating the possibility of expanding its use of RFID into other areas of the facility as well, to provide more extensive tracking and tracing capabilities.

1 Bis rue Antoine Lavoisier | Immeuble l'Albatros | 31770 Colomiers | France
+33 5 67 69 74 60 | contact@frequentiel.com | www.frequentiel.com

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