

Reproductive Clinic Uses RFID to Guarantee Parental Identity

At Overlake Reproductive Health, passive 13.56 MHz RFID tags and interrogators track human sperm, eggs and embryos throughout the assisted-reproduction process.

By Claire Swedberg

Oct. 15, 2007—[Overlake Reproductive Health](#), located in Bellevue, Wash., has become the first reproductive-medicine center in the United States to deploy an RFID-based system for tracking human eggs, sperm and embryos. This system should help ensure that no identity mistakes are made during collection, storage and fertilization.

A female client can visit the clinic to be artificially inseminated by a partner's sperm, or to have her egg fertilized in vitro (in a test tube) and then implanted in her uterus. For either procedure, the couple may worry that the sperm or egg might be accidentally switched with someone else's, resulting in a baby that is not biologically theirs. Although such mistakes rarely happen, the experience can be traumatic for parents when they do occur, subjecting a clinic to lawsuits and negative publicity.

Until the RFID system was deployed in September, Overlake, like other in vitro fertilization (IVF) clinics, relied on the diligence of its employees to ensure that samples were never confused. When a patient provides sperm or eggs, the specimen is marked with the client's name, and if transferred to another receptacle, it is again marked with that patients' name. Usually, two employees manually check the names to prevent a mistake from being made. That system had been working appropriately, says Overlake's laboratory director, Shaun Kelly, but patients were still uneasy.

At a recent [American Society for Reproductive Medicine](#) (ASRM) conference, Kelly happened upon [Research Instruments](#), a U.K. manufacturer of RFID solutions, and saw a potential solution. "I was really intrigued by the whole thing from the get-go," he says. Research Instruments provided Overlake with IVF Witness, an RFID-based system that helps keep specimens from being inadvertently switched.

Upon arrival, a patient is provided an ID card containing a 13.56 MHz RFID chip complying with ISO standard 15693. A staff member at the front desk inputs data about the patient, and a Research Instruments RFID interrogator captures the ID card number, which is linked to that data.

Each specimen is placed in a container with an RFID tag affixed to its bottom. When the container is placed on an interrogator, the system prompts the user to assign a particular patient to that specimen. IVF Witness permanently links the container's tag ID number with that patient, so that the tag numbers for both sperm and eggs are input into the same patient account. When a specimen is sent to a lab, it passes several workstations, each equipped with an RFID reader. There are three readers in the sperm-prep lab; two in the embryology lab, where eggs are fertilized and developed; and one in the procedure room, where eggs are removed from a female client, and where sperm or embryos are implanted in the patient's uterus.

At every step in the process, each specimen container is placed on a plate with an RFID reader, which captures the container's tag ID. IVF Witness opens that patient's account, and if any specimens tag IDs do not belong to that account, the system transmits an alert, emitting an audible alarm and displaying a red stop sign on the workstation screen. When this happens, the system cannot be restarted until an explanation is input to the system.

"The patients are incredibly happy with it," Kelly says. New patients in particular, he adds—who have not yet had the opportunity to build a level of trust with the Overlake staff—find the RFID system reassuring. According to Kelly, Overlake continues with its original practice of hand-marking each specimen and using two witnesses to ensure the owner's identity, but now it also has another layer of security. Although no situation has yet caused the system to issue an alert, Kelly says, the medical center has tested the system repeatedly and it is functioning properly.

"It is expensive," Kelly says, citing the system's price tag of nearly \$60,000, and the clinic has had to extend some of that cost to clients. "They're not complaining," he notes. "They're happy to have that security."

RELATED_ARTICLES Overlake typically completes up to 500 embryonic procedures annually. The system does not have FDA approval but doesn't need it, according to Research Instruments. Still, the RFID system provider has tested it with mouse embryos to ensure that radio waves do not harm specimens. In Research Instruments' tests, the tags transmitted continuously for four days without any perceptible effects on the mouse embryos.

RFID was chosen for this application, rather than bar-coding or some other technology, because it enabled a passive inventory check of the work area prior to the procedure being carried out, says David Lansdowne, technical director and patent holder at Research Instruments. With RFID, Lansdowne explains, lab personnel do not have to scan an item—they can simply place it on the workstation plate, and its ID number will be captured. Because automatic ID confirmation occurs as soon as a specimen is placed on the workstation, he says, a clinic "can ensure that laboratory SOPs [standard operating procedures] are being followed—something that is impossible with bar-code systems."

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