

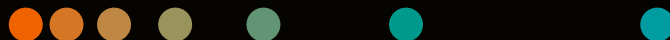
A portrait of a woman with dark, curly hair, looking directly at the camera. The image is tinted with a teal/cyan color. To the right of her head, there is a complex, glowing orange network of lines and dots, resembling a data visualization or a neural network.

Brochure

Improving patient experience through Real-Time Location Systems

Leveraging a well-established industry technology
to optimize clinical operations

[siemens-healthineers.com/real-time-location-systems](https://www.siemens-healthineers.com/real-time-location-systems)



The solution

Keeping track of assets



We spend a lot of time looking for things – 2.5 days per year, according to a 2017 study commissioned by Pixie, a consumer-focused location technology company¹. Now imagine you need to keep track of several thousand patients and staff, and tens of thousands of pieces of medical equipment. Where do you even start? When they are required by a certain clinical pathway, how can equipment and personnel be found efficiently?

Real-Time Location Systems (RTLS) are technology solutions that answer these questions. RTLS – sometimes referred to as indoor GPS – generally involves placing a “tag” that communicates with a receiver on an item or a person, providing information that can determine the location of the tag, and thus the item or person carrying it². Large hospitals may have tens of thousands of assets to track, which can translate to many non-value-added hours staff saved looking for equipment.

¹ <https://getpixie.com/blogs/news/lostfoundsurvey>

² Healthcare RTLS systems use a variety of technologies, including Infrared, Ultrasound, WiFi, Ultra-Wideband (UWB), and Bluetooth Low Energy (BLE). Some RTLS systems can be supplemented by the selective use of passive RFID and GPS technology.

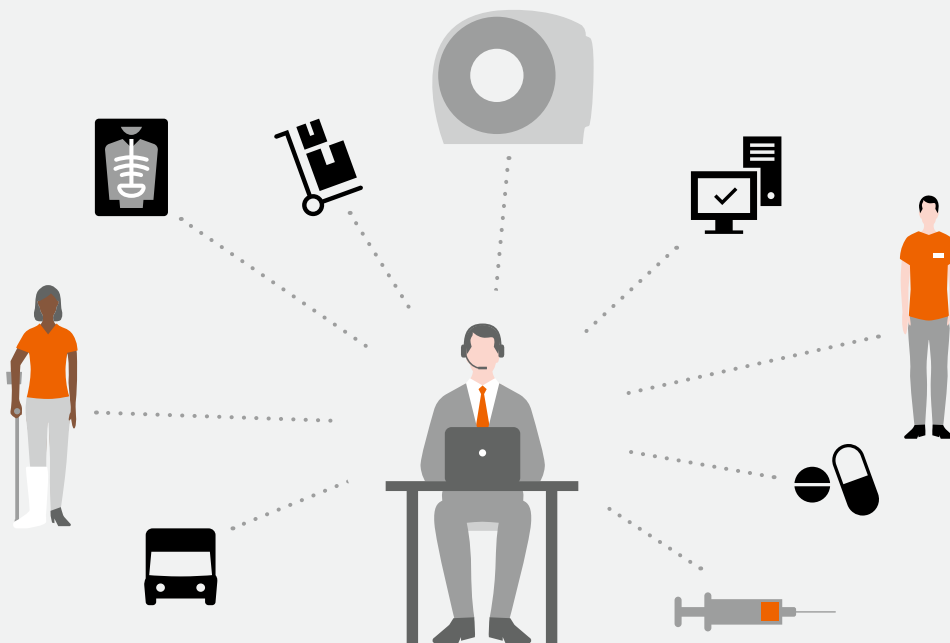
Beyond location

The uses of RTLS go beyond locating equipment or people. Location history and time in transit can be used to quickly establish context. In other words, not only do you know where something is now, but you also know how long it took to get there, where it was before, and if it is currently being used. If a technician needs to perform routine maintenance on a critical piece of equipment, RTLS can locate the equipment and can even let operators know if it's available or in use by combining it with staff/patient location information and history.

RTLS can also enhance safety. Workers in many industries may have reasons to enter hazardous areas. RTLS can track when a person enters a dangerous area and how much time they spend there and can alert others if the person fails to leave the area in the expected timeframe.

The data generated by RTLS help healthcare providers to optimize processes and improve efficiency. Location data from RTLS allow rapid identification of bottlenecks and inefficiencies. RTLS information can also paint a picture of equipment utilization rates, guiding purchasing decisions to optimize efficiency or increase capacity as desired. For example, a major academic hospital in the US saved over \$3.5 million USD by avoiding equipment purchases and reducing rental expenses. In this case, RTLS increased visibility of key assets and provided data that induced process changes.

Furthermore, RTLS can be used to automate processes based on the location of items or personnel. For example, an alarm can be shut off if the right person arrives at a location. Additionally, arrival of a person in a certain room or location can be documented and used to trigger preparation for a procedure.



RTLS technology enables optimization of patient experience, staff safety and asset usage.

The benefits

RTLS takes off in healthcare

RTLS is well suited to the unique challenges faced by healthcare provider organizations, where multi-disciplinary coordination and complex technology are an integral part of most care pathways. An RTLS system can reveal both the location and status of a piece of equipment – an IV pump, for instance – so that, when needed, staff can find it and verify it is clean, prepped, and ready for use.

RTLS enables safety improvements by tracking items moved beyond a clearance zone, or by enabling security staff to quickly locate and send help to a staff person in distress. Pathways for sample transport can be optimized. Environmental monitoring applications can often be integrated, tracking that patient samples, medication, and other temperature-sensitive materials are always kept at safe temperature levels.

And what about patients? RTLS is used to manage and optimize patient waiting times. RTLS solutions can help

patients move through the care facility more quickly and easily giving them clear information on what to expect throughout their in-hospital experience. Monitoring the location and status of patients alerts members of the care team to be ready for the next steps in the patient's journey, while also keeping patients apprised of expected wait times and other key information. RTLS data also helps identify areas for improvement, so patients receive better care more quickly. No one wants to spend more time than necessary in a hospital!

RTLS provides a broad range of applications. For a healthcare provider organization to get the most out of the technology, it is important to match requirements to the desired use cases. It is important that the RTLS system is managed so that it runs reliably and continuously to ensure users can trust it. And of course, the system should be planned and implemented to ensure that benefits and efficiency savings are realized and that these benefits outweigh costs.

Partnership: The key to success

Siemens Healthineers collaborates with Infinite Leap to provide RTLS solutions to healthcare provider partners. According to Infinite Leap CEO Mark Rheault, a partnership approach is the key to successfully implementing RTLS. Internal partnership and advocacy enable RTLS projects, while the partnership between Siemens Healthineers, Infinite Leap, and the provider organization enable optimal use of RTLS technology.

"We see RTLS as a natural complement to services like consulting and clinical workflow optimization. RTLS data

allows greater depth of insight and provides real-time metrics", said João Seabra, Global Head of Enterprise Services at Siemens Healthineers.

Mark Rheault of Infinite Leap echoes this sentiment: "RTLS is part of the medical technology mix, and supports the other services Siemens Healthineers provides; it enhances and informs procedure and room planning, purchasing, and staffing," he said. "This approach yields dividends for hospital staff, administration, and patients."

"Having the ongoing support of stakeholders at all levels is a critical factor for successfully implement changes within a department. Therefore, the clinical executive sponsor, the department head, and staff should be involved in RTLS efficiency programs right from the beginning."

Mark Rheault, CEO Infinite Leap

The future

Improving the patient journey

As this technology evolves, Rheault foresees a virtual concierge experience for patients, who will be guided through their care journey by RTLS-enabled technology. He compares this experience to RTLS technology used at Disney theme parks: “They [Disney] have guests wear wristbands with tags, and as they walk through the park, the wristbands locate guests and their family members, and can display this information in an app. You won’t lose your kids, and the same wristband can admit you to a ride or pay for your lunch.”


This approach can help patients, their families, and hospital staff stay informed through every step of the patient’s journey.

“We now have a way for patients to automatically check in for their appointment, and they can see their estimated wait time without needing to ask the staff. With RTLS, everybody in the whole cycle – the staff, the patients, the family – have visibility into the patient journey and the context around what is happening,” said Rheault.

Do you want to leverage RTLS technology to improve patient experience?

Get in contact:

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João Seabra sees a bright future for RTLS in healthcare. “We at Siemens Healthineers believe that RTLS provides a technology to optimize operational and clinical workflows. It’s going to become a primary way for healthcare enterprises to improve outcomes and reduce costs,” he said.

RTLS is now moving from well-known applications in asset management and automation of operational processes to clinical uses. Early adopters are already tracking patient movements after surgery to get early indications on the recovery process and how to optimize it. RTLS is the kind of smart application of technology that can transform care delivery.



Case Study

RTLS drives improved efficiency and patient satisfaction at Wake Forest Baptist Health

Since 2012 Infinite Leap has provided RTLS services and system integration for Wake Forest Baptist Health, a nationally recognized academic medical center and healthcare system in North Carolina, USA.


Wake Forest Baptist Health's ambitious Enterprise Visibility Program currently encompasses more than 390,000 square meters of RTLS coverage across more than 40 buildings. It is among the largest, most comprehensive implementations of RTLS technology in a healthcare setting anywhere in the world. This extensive RTLS infrastructure enables Wake Forest Baptist to streamline the management of mobile medical equipment and optimize patient flow while giving staff more time to spend with patients.


Siemens Healthineers is joining forces with Wake Forest Baptist Health and Infinite Leap to incorporate RTLS data into a robust Digital Twin for Workflow Excellence that will allow Wake Forest Baptist Health to create a model of work processes, patient flow, and other scenarios in order to optimize processes in the real world. This will further drive value creation and enable them to generate additional results through their RTLS infrastructure implementation.





Wake Forest Baptist Health's Enterprise Visibility Program at a glance

 **16,000** assets tracked in real time

 **364,000** patients per year using RTLS badges for enhanced patient experience

 **7,600** staff experiencing a safer work environment by wearing location badges

 **11** systems, including Epic electronic health records, augmented with real-time data via integrations

 **250,000,000+** real-time events processed each day

\$500,000 annual reduction in equipment purchases

\$300,000 annual savings through automated temperature monitoring

\$2,000,000 value of unproductive hours recovered

- 1,300 temperature units monitored in real-time to ensure quality compliance and reduce waste
- In one instance over \$90,000 worth of flu vaccine was saved from spoilage
- 8% of refrigeration units were immediately found deficient and replaced

\$10,000,000 validated return realized within the first 4 years of the project

The Enterprise Visibility Program has paid real, measurable dividends, but financial results are only part of the story. ***“Through the use of RTLS technology, we have reduced patient wait times by up to 50%, which makes our patients happier and our waiting rooms less congested,”*** said Conrad Emmerich, Senior VP Business Services at Wake Forest Baptist Health.

“Our staff doesn’t need to look for the equipment they need to provide patient care. This enabled us to convert thousands of “non-value added” hours towards patient care.”

Conrad Emmerich, Senior VP Business Services, Wake Forest Baptist Health.



About Value Partnerships

Siemens Healthineers Value Partnerships combine our strength in holistic medical technology management and digitalization into a long-term performance-oriented engagement focusing on the creation of value. Value Partnerships give you access to services like RTLS, which can help you improve patient experience, increase efficiency, and get a clearer picture of equipment utilization at your facility. With our sustainable healthcare consulting and transformation services as well as our future-proof design planning, we are well positioned to co-create a solution with and for you, which will generate clinical, operational, and financial benefits.

Siemens Healthineers Value Partnerships help you optimize operations today, expand with new capabilities tomorrow, and advance the level of innovation in your network.

The products/features and/or service offerings (here mentioned) are not commercially available in all countries and/or for all modalities. If the services are not marketed in countries due to regulatory or other reasons, the service offering cannot be guaranteed. Please contact your local Siemens Healthineers organization for more details.

The results described herein by customers of Siemens Healthineers were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g., hospital size, case mix, level of IT adoption), there can be no guarantee that other customers will achieve the same results.

The scientific overlay on the title is not that of the individual pictured and is not from a device of Siemens Healthineers. It was modified for better visualization.

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