

Title: Using Real Time Location Services (RTLS) to Maximize Practice Efficiency

Creator: Jody Pellerin

The term “patient journey” evokes the image of someone moving along a path. In the medical practice, however, this is a journey with many stops along the way: the waiting room, the exam room, the laboratory, and elsewhere. By the end of this wearying march your patients are out of patience.

To give you an idea of the root causes of unhappiness with healthcare services, a [2012 assessment](#) by the American Hospital Association found that poor communication was the biggest contributor to poor patient workflow. AHA found communication issues were at the heart of 60% of problems in this area. Lack of visibility to data came in next, causing 30% of issues.

To improve communication, data visibility and, by extension, the patient experience you need efficient workflows. Designing these workflows requires data but data collection has always been highly work-intensive. Now there is a technological solution which collects data without extra work for your staff, disruption to the practice, or anything more invasive for your patients than wearing a simple badge.

Real Time Location Services, RTLS, can help your organization track patient and staff the movement during the course of appointments. Analyzing the resulting data provides the needed information to develop a more efficient patient journey and enables you to reduce wait times as well as costs without reducing time in patient engagement.

Real Time Location Services: A Brief Overview

Industrial time and motion studies gave birth to RTLS decades ago. These were methods used to determine the most efficient way for people to do their work, a plant to convey parts, or a warehouse to improve the logistics of moving product.

As technology advanced, the ability to track and monitor the movement of people within a given area was simplified until, today, you only need a small RFID (radio frequency ID) chip mounted on a badge that can be worn by patients, staff members, and providers.

Sensors installed throughout the medical office suite gather information about where patients go during an appointment, where and how long they must wait, who is with them, and the path they take through your practice. The data is transmitted and saved to a computer database ready for analysis using a software application to map patient movements.

Only at this point, when hard data converts into information, can you develop a comprehensive solution to the difficulties your patients face during their time with you.

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RTLS Technology 101

At the heart of [RTLS](#) is the RFID chip and sensor array that make it possible to accurately track movement within a defined area. A radio frequency ID chip, the same type of chip hospitals use to track assets, produces a signal received by each sensor as the chip comes into close proximity.

Radio frequencies have been found to be the most reliable within an area that is separated by walls and where the subject may not always be within line of site. Intelligent placement of sensors at chokepoints and throughout the facility can identify not only the location of the RFID chip but the direction it moves.

The sensors passively gather and transmit data to a computer database where it can be stored and retrieved for later analysis. In addition, the movements of the chip are tracked in real time, quickly providing the location of a patient or staff member whenever needed.

The badge and chip are only worn within the practice, preserving the privacy of patients and staff alike once they leave. Keep staff engaged in the project with transparency about how the information will be used; adoption increases more rapidly. Patients typically appreciate seeing process improvement activity but staff can become nervous if it seems like Big Brother is watching.

Planning and Scoping Your RTLS Project

Instead of looking at this as an equipment purchase, think of it as purchasing a solution to a problem. Before approaching a vendor, you need to do your homework. Here are some of the decisions you will need to make:

- Required level of locating ability
 - o Room level
 - o Sub-room level
 - o Choke point (doorways)
 - o Associative (one or more persons in proximity)
- Active vs. passive signaling
- System scalability
- Update frequency
- Cost vs. time and space resolution

Depending on your facility, most physician practices need at least room level locating ability. If you have one or more large rooms, you may wish to break it to the sub-room level. Choke points are the entry and exit points of a particular space and understanding where these are helps build a more efficient traffic pattern.

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RTLS does more than locate where a patient or provider is within the space. It also shows how long two tracked entities are within the same space. This can show how long the physician, nurse, or technician spends with the patient and, potentially, whether a particular healthcare provider has already seen the patient.

If you have plans for future expansion within your space, build the requirements for scalability into your project and system needs. Also, choosing a vendor that can accommodate a larger scale facility should be a consideration.

Other information to find out:

- Power requirements and battery life
- Water resistance (if this is a concern in your practice)
- Sensor range
- Installation and maintenance cost and time

Once you have made these decisions, however, you should involve a member of the vendor team as soon as possible. The vendor will be able to help you determine sensor layouts, badge circulation, and the appropriate software for your particular RTLS project.

Data Analysis and Workflow Evaluation

Metrics on specific activities can be tracked and analyzed, such as:

- Time at check-in
- Wait times
- Time spent with provider, nurse, or technician
- Time in diagnostic testing
- Overall length of stay

These metrics make it much easier to create an efficient workflow. When plans are created around anecdotal information or the tracking of only one or two patients through the workflow, processes are put into place that may not be flexible enough for other situations or excess effort could become embedded into the process.

RTLS provides a wealth of data points that can be mapped and evaluated. A map of the current workflow driven by RTLS data shows the reality of the patient journey as it exists now. This creates a benchmark against which to measure progress as new workflows are put into place.

With continuous monitoring you can also determine whether the new flows and processes are working as well as expected. As time goes on you may find new ways to improve activities like traffic flow and patient hand off.

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Reporting Options

Pulling tracking data from an EHR is a relatively simple task. What isn't simple is obtaining the data passively and with as much granularity as an RTLS option can provide. With RTLS you can identify a variety of parameters to help with workflow development. Tracking data can be broken down by patient type, provider, specific days and times, and more.

New Process Development

Once the current workflow data map is created, you can begin developing new practices to eliminate or mitigate excess wait times and interoffice travel of both patients and staff. Travel and wait-times patterns are built through the use of the massive amounts of data you can now gather from the daily movements within your medical practice. A consultant uses statistical analysis to build and run scenarios and simulations of various workflow solutions. Running multiple scenarios will yield potential fixes to problems found:

- Overcrowding
- Lengthy wait times
- Excessive patient travel
- Too many or too few touch points
- Time needed to find staff or patient

Improved Outcomes

With the new processes in place, having already been simulated in the software for viability, RTLS can begin to monitor the smoothness of the new traffic patterns. Bottlenecks should be a thing of the past and new data will continue to be analyzed to improve performance.

RTLS can also be combined with lean principles such as Six Sigma to find more efficiency within the process. For instance, with a steadier workflow, time can be used during the course of the day to provide indirect care instead of batching it at the end of the day. Medical assistants won't begin the next day behind and the providers will have no more late nights.

With better staffing allocation, you may be able to shrink the office workforce or see more patients. Shorter wait times can mean shrinking or doing away with the waiting room. The patients can be roomed upon check-in. There is an added benefit of better infection control; if a patient comes in with a contagious illness, other patients will not be exposed. Also, you will be able to identify the people who came in contact with that patient to provide notification or preventive care.

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Success Stories

Key Whitman Eye Center began using RTLS in January 2013. [The facility](#) used badges and sensors to record when patients were in each area of the ambulatory surgery center and how long they spent there. The use of passive data gathering solutions has proved very beneficial not only for Key Whitman but their patients alike. Through data analysis and process improvement recommendations, the leadership was able to identify critical workflows that were detracting from a positive patient experience, and optimize processes that created a more favorable one.

[Pacific Medical Center](#) - Canyon Park in Bothell, WA, deployed RTLS in April 2010. The results from patient and staff tracking allowed them to design the new facility in such a way as to increase patient flow by 35-40% and double their net revenue projections.

[Virginia Mason Kirkland Clinic](#) used RTLS to design a facility without a waiting room. Each patient receives a badge at check-in and is directed to an exam room right away. Data from the badge informs staff and providers when patients are ready to be seen. In existing facilities, the area taken up by a waiting room can be reduced or reused for revenue generating activities.

Conclusion

Real time location services (RTLS) is a superior method of tracking and analyzing movement for the purposes of improving the patient journey. It is a nearly invisible process that takes no additional time from providers, allowing more time for patient engagement.

For a more in-depth look at the benefits of RTLS implementation

[CLICK HERE](#)

For the Case Study