

RTLS in the Healthcare Sector

Healthcare is a key pillar of modern societies. We place a high value on the healthcare industry because access to high-quality medical care has significantly positive effects on the lives of individuals and the health of the nations that those individuals live in.

The healthcare industry is always looking for the next breakthrough. Testing new game-changing medications and developing new life-saving procedures. In addition to constantly developing new ways to treat patients, the industry is also extremely innovative in finding ways to improve the day-to-day operations of healthcare facilities to make them both more efficient and safer for both patients and staff.

One of the technology solutions gaining great traction in the healthcare industry is real-time location systems (RTLS). There are countless ways that RTLS can be used in healthcare. Let's explore a few of them.

Saving Lives

The ultimate goal of the healthcare system is to save lives. While the availability of qualified doctors performing lifesaving procedures is undoubtedly essential, there are also many operational improvements that can be made in hospitals to save the lives of patients. RTLS systems are great for implementing such improvements.

Here are some examples of how RTLS can save lives:

- ✔ **Enforcing Hand Hygiene Compliance**
- ✔ **Providing Faster Care**
- ✔ **Tracking Equipment**
- ✔ **Optimising ER Processes**

A great example of how RTLS can save lives is using the technology to enforce compliance to good hand hygiene practices. Even though we associate hospitals with the smell of disinfectants, thousands of people die from infections contracted in healthcare facilities every day.



Location-based solutions in the healthcare sector provide a wide range of benefits, from saving lives to improving user experience and patient care.

Far too often these infections are transferred from patient to patient via the staff because of inadequate hand hygiene. The COVID-19 pandemic has made the importance of good hand hygiene practices clear to all of us, but enforcing compliance in hospitals could also protect patients from a whole host of other infections. RTLS systems can help. They can be used to check that doctors and nurses always wash their hands between patients, reducing the transfer of infections that are particularly dangerous for patients whose immune systems could already be weakened by their original condition.

Location-based systems can also be set up to alert doctors and nurses to patients needing medical attention, enabling them to respond faster with medical attention. For example, if hospital wristbands are fitted with tags that can measure static location and motion, then staff could be alerted as soon as a patient falls to the ground, falls out of bed or tries to get out of bed against doctor recommendations. This way staff know that their attention is needed by a specific patient and also where to find them. This improves the quality of care but in some cases can even save the life of that patient.

In addition to alerting staff the patient needs, RTLS can also help staff respond more effectively to care needs

through asset tracking. In many medical emergencies, time is of the essence. However, hospitals are typically large buildings with all sorts of equipment spread over several floors. Location-based solutions can help staff locate the needed equipment without delay using a mobile app, so that valuable time that could be used treating the patient is not wasted searching for things.

Another benefit of RTLS solutions can be found in the Emergency Room (ER). Oftentimes, ER patients are admitted into care based on the severity of their injuries rather than the order in which they arrive. RTLS can be used to help staff track how long individual patients have been waiting and make sure that someone checks up on them from time to time to make sure that their condition has not deteriorated. The same system can also be used to locate the patient when it is their turn to see the doctor if they have wandered away from the waiting room. In addition to better care, the system also helps hospitals track that they are meeting service-level agreements (SLA).

RTLS can be powerful tools to help hospitals get help to patients when they most need it, while simultaneously keeping patients safe from the spread of additional infections. RTLS can save lives.



In the U.S. alone,
Healthcare Associated Infections (HAIs)
are the cause of fatalities for

80,000
patients per year

WHO
World Health Organization
<https://www.who.int/>

Monitoring Safety

While RTLS is an incredibly effective real-time tool for preventing immediate harm to patients, the same infrastructure can also be used to monitor that everything is going smoothly and provide data for preventative measures that may be needed. Challenged by the global COVID-19 pandemic, healthcare providers are increasingly exploring the possibilities that RTLS provides for different monitoring solutions that can be used to keep both patients and staff safe.

Here are some examples of how RTLS can monitor people's safety:

- ✓ **Contact Tracing**
- ✓ **Social Distancing**
- ✓ **Quarantine Monitoring**

One of the key needs highlighted by the pandemic is for better contact tracing solutions. The healthcare sector needs access to information about who has come into contact with staff or patients that may have contracted a contagious illness, so that they can take effective preventative measures such as enforcing quarantines. Luckily, RTLS can provide such solutions. Collected tracking data can be viewed as a recorded playback to trace how staff members and patients have interacted, which can be used to evaluate who could be infected and even potentially identify the source of an outbreak at a particular healthcare facility.

The same solution can also be used to enforce social distancing practices within healthcare facilities. The system can be configured to send alerts if people get too close to others, especially for longer periods of time. This can even be visualised with a halo effect on a map view of the hospital. Not only can this help analyse the data for contact tracing purposes, but it will also allow real-time warnings to be sent to the patients and staff as needed, allowing them to take immediate social distancing actions.

Another use of RTLS for keeping patients and staff safe is quarantine monitoring. By using location data, the system can monitor whether quarantine conditions are being adhered to and to send alerts to the relevant parties if patients leave quarantine. This can be an effective measure for preventing the spread of infectious diseases as action can be taken early.

RTLS is a useful tool that, in addition to the real-time life saving solutions, can also provide a range of monitoring solutions for healthcare. What is even better, is that all of these solutions can be implemented through the same infrastructure, allowing healthcare facilities to extend the solution as their needs change. Even making it possible to react faster to new unexpected health challenges.

Reducing Costs

The function of hospitals and other healthcare facilities is to care for their patients, but unfortunately they are still limited by budgets. As unlimited funds are not available for running healthcare services, decision makers are always looking for ways to save money that do not have a negative impact on the level of care that can be offered. One of the big advantages of RTLS is that they are great for improving operational efficiencies.

Here are some examples of how RTLS can improve cost effectiveness:

- ✔ **Medication & Crash Cart Inventories**
- ✔ **Asset Tracking**
- ✔ **Legal Compliance**

To provide care for numerous patients with a whole variety of ailments, hospitals need to be well stocked with different types of medications and equipment. Keeping track of all of these things, their expiration dates and whether or not they have already been disinfected and are therefore ready for use takes up a lot of time that could otherwise be used to care for patients. RTLS can provide time-saving solutions by, for example, automating inventory counts. The system can also be set up to alert staff to upcoming expiry dates so that more can be ordered in good time and to measure environmental factors to make sure that medicines that are temperature sensitive are kept at a steady temperature. The automatic inventories are particularly useful for crash cart management as instead of doing tedious counts throughout the day, nurses can just scan the cart using a mobile device and get immediate feedback on whether everything that needs to be there is there. RTLS saves time, and as they say: time is money.

HAIs cost society

\$28bn

per year

NCBI
National Center for Biotechnology Information
<https://www.ncbi.nlm.nih.gov>



As mentioned earlier, RTLS can be used for locating equipment. As well as saving lives, this can also save hospitals significant amounts of money. Hospitals are filled with all sorts of medical devices, some of which are extremely expensive. Because of the complicated logistics of hospitals, sometimes these devices get lost. Using RTLS to locate misplaced equipment can save hospitals thousands if not millions that would otherwise have been used to buy replacement equipment. The savings element of asset tracking can also be seen in less expensive items such as hospital beds that are typically rented according to need. Often nurses store beds out of sight and out of mind in specific sectors of the hospital. When stored, the beds are just an additional cost for the hospital. To make matters worse, staff are often not made aware of the location of beds in storage areas, causing an unnecessary overstock of equipment when new orders are placed. When you imagine how many beds there are in a hospital, you can see the costs racking up because of this inefficiency, which could easily be remedied using RTLS.

RTLS can also be an effective way for hospitals to monitor their operations as an insurance against potential lawsuits. Most hospitals have patient promises, for example how often staff check up on patients and how often they receive medical attention. These are particularly common in cases where patients are in critical condition or suffer from various mental illnesses. If something happens to the patient and these patient promises have not been met, hospitals may be sued for significant sums of money. RTLS can be used as insurance against such lawsuits as they can provide reports that show the doctor or nurse did visit the patient as agreed.

RTLS provides multiple solutions for improving inefficiencies in the operations of hospitals that can save hospitals money that could otherwise be used for the medical care of patients.

Increasing Security

Security is always a key issue for large facilities like hospitals, where there are many people coming and going daily. For hospitals, this issue is also augmented by the fact that they have a number of vulnerable patients in their care and a whole range of equipment and medications that could be dangerous in the wrong hands. RTLS can offer solutions to make hospitals even safer than they are already.

Here are some examples of how RTLS can increase security:

- ✓ **Assistance Buttons**
- ✓ **Child Abduction**
- ✓ **Access Control**

One way in which RTLS can make hospitals and other healthcare facilities safer is by providing both staff and patients with devices equipped with a button with which they can call for help when needed. This way a patient can call for help if their condition changes and they need medical assistance. In the same way, if a staff member feels that they need reinforcements, they can call for help at the touch of a button. Once again, RTLS is providing assistance far more effectively as the responders can immediately see the location of the person in need of assistance and make their way to them without delay.

RTLS can also be used for access control to make sure that those without authorisation cannot access areas that they should not. Typically this is implemented by adding tags to staff ID badges or keycards. The system can then automatically let authorised personnel in while leaving people without authorisation locked out. RTLS is particularly good for these types of use cases as there is no delay in response. This means that as soon as the authorised doctor arrives at the locked door, it is unlocked and he or she can get through. One major use of access control is in preventing child abductions. Here doors from the maternity ward will only open for the right combination of carer and child.

RTLS can help make hospitals and care facilities even safer by making sure that assistance is available when needed and only authorised personnel have access to certain areas.



Improving User Experience

Hospitals are, in general, quite hectic and stressful places for both staff and visitors. RTLS can even be used to improve user experience in these types of stressful environments.

Here are some examples of how RTLS can improve user experience:

- ✓ **Optimising Routes**
- ✓ **Paperless Work Orders**
- ✓ **Visitor Navigation**
- ✓ **Less Invasive Patient Monitoring**

RTLS can help lighten the load of healthcare workers by optimising their routes at work. If asset tracking is implemented, then staff can easily locate the equipment and patients that they need to get to and take the most direct path to them. This saves time and physical effort. Historical data can also be analysed to see if there are any inefficiencies in the hospital setup and daily routines that could be eliminated to make it easier for staff to get from task to task. On the surface, reducing the additional physical strain on workers caused by extra walking through the day seems like a small thing, but in the long-term it can be significant for worker wellbeing.

In addition to optimising routes, the possibility to implement paperless work orders using RTLS solutions can make the days of healthcare workers easier. Paperless work orders mean that instead of checking charts and other documents manually, a doctor or nurse gets an alert to their mobile device as they enter a room instructing them on what needs to be done. This is much less hassle for the staff, making them happier and more productive.

While RTLS can significantly improve conditions for workers, they can also be used to improve the experience of hospital visitors and patients. The system can be used to direct visitors to where they need to go without getting lost in the labyrinth of corridors that usually make up hospitals. Navigation aids can be shown directly on the user's mobile device or through custom signs shown on screens as the user reaches a certain point. Finding loved ones quickly and easily can help alleviate at least a bit of the tension often associated with hospital visits.

RTLS can also be used to improve user experience for patients in care homes. A typical challenge is that while patients cannot be allowed to roam freely for their own safety, we do not want to lock them up in a prison either. Many alternative solutions, such as cameras, feel very invasive to the privacy of those patients. RTLS offers a less invasive solution. Patients can be given wristbands with tags that enable location-based systems to keep track of them. The tags can even be configured for access control to make sure patients cannot enter areas that are not safe for them. This solution offers patients more freedom to wander while still keeping them safe.

RTLS is an efficient tool for improving the user experience for people working in hospitals and other healthcare facilities, the visitors to those facilities and also the patients in the care of these facilities.

Even though this article only scratches the surface of what RTLS can do, we can already see that this is an incredibly versatile technology providing solutions for improving healthcare services. RTLS can be used to save lives, improve patient care, save money, improve user experience and increase security. Location has the potential to change the way we think about healthcare.