



RFID and RTLS in Healthcare

▶ Myths and Realities



*Delivering Real-time
Visibility to the
Enterprise*

RFID and RTLS in Healthcare

RFID and RTLS are being widely deployed in multiple industries for asset tracking applications, within primary care facilities, research laboratories, manufacturing facilities, distribution centers, vehicle fleets, maintenance depots and elsewhere across the value chain.

Real-Time Asset Tracking projects vary based on the assets themselves, the environment in which they are tracked and the business processes and corporate functions they impact. Over the past decade, OATSystems has deployed hundreds of RFID and RTLS applications, tracking assets as diverse as medical supplies, aircraft subassemblies, agricultural seeds, tissue samples, reusable transport items, controlled pharmaceuticals, industrial machinery, lab equipment and storage trailers.

In Healthcare, different kinds of organizations use asset tracking for different purposes. Hospitals and clinics may track medical equipment and consumables. EMS teams, may need to pay extra attention to the location of small, highly mobile supplies and equipment stored on their trucks. Medical laboratories need to automate medical specimen tracking, while medical device and pharmaceutical firms have asset tracking processes similar to other complex manufacturers.

5 Common Myths about RFID & RTLS Asset Tracking

- 1 Myth: Asset tracking is only for hospitals, especially large ones.**
Reality: Asset tracking already is being widely used in a number of different healthcare segments other than hospitals
- 2 Myth: Asset tracking is all about following the movement of medical equipment.**
Reality: Tracking medical equipment is important, but there are also business cases for tracking other capital assets, as well as consumables
- 3 Myth: RTLS is the only technology for asset tracking in a hospital environment, and it's expensive.** Reality: RTLS is a great technology for asset tracking, but it's far from the only option. Healthcare firms are using Wi-Fi, Passive RFID, GPS and Barcode, often within the same facility
- 4 Myth: RFID tags are expensive, so only high-value assets are tracked.**
Reality: RFID tags range in price from a few cents for passive labels to several dollars for ruggedized active tags
- 5 Myth : ROI is hard to quantify unless It's an enterprise-wide deployment.**
Reality: High-impact business processes have demonstrable ROI

Note: Although RFID and RTLS are referred to specifically within this document, UWB, Wi-Fi, along with other Auto-ID and sensor technologies may be used interchangeably for real-time enabled applications. A comparison of sensor technologies is listed under Myth #3.

1 MYTH: Asset tracking is for large hospitals

REALITY: Asset tracking already is being widely used in a number of different healthcare segments other than hospitals. These include medical labs, emergency medical services, doctor's offices and clinics, and even manufacturers of healthcare products, supplies and medications. Even relatively small doctors' practices are using asset tracking to track equipment for service and maintenance schedules, as well as keep track of incoming medication and consumables. And, hospitals are deploying asset tracking in highly diversified settings and applications, from inventory management of equipment and supplies to compliance and real-time asset location. The following table lists some of the most common business processes for RFID and RTLS Asset Tracking:

COMMON RFID-RTLS APPLICATIONS - HEALTHCARE

Application:	Used by:	Assets Tracked:	Why RFID / RTLS Asset Tracking?:	Performance Metrics:
EQUIPMENT TRACKING	<ul style="list-style-type: none"> ▪ Hospitals ▪ Clinics ▪ Laboratories ▪ EMS Providers ▪ Medical Device Manufacturers ▪ Pharmaceutical Firms 	<ul style="list-style-type: none"> ▪ Medical Equipment ▪ Testing Equipment ▪ Facilities Equipment ▪ Manufacturing Equipment ▪ IT Assets 	<ul style="list-style-type: none"> ▪ High value assets, high cost of capital ▪ Poorly-maintained assets can compromise quality of care and patient safety ▪ Improved operational efficiency ▪ High cost of compliance audits 	<ul style="list-style-type: none"> ▪ Significant reduction in duplicate inventory & rental equipment ▪ More efficient staff allocation ▪ Streamlined documentation/recordkeeping ▪ Reduction in service parts inventory ▪ Fewer manufacturing, logistics quality issues due to poorly maintained equipment
TEMPERATURE MONITORING & STERILIZATION	<ul style="list-style-type: none"> ▪ Hospitals ▪ Clinics ▪ Laboratories ▪ Medical Device Manufacturers ▪ Pharmaceutical Firms 	<ul style="list-style-type: none"> ▪ Surgical Instruments ▪ Vaccines ▪ Medical Specimens ▪ Perishable Materials ▪ Medical Devices 	<ul style="list-style-type: none"> ▪ Labor-intensive paperwork, documentation processes ▪ Risk of compromising patient safety, drug efficacy ▪ Material waste ▪ Risk of regulatory fines 	<ul style="list-style-type: none"> ▪ Improved processing time, without compromising safety ▪ Streamlined documentation ▪ Reduction in logistical errors, and associated costs ▪ Increased efficiency and auditability
CONSUMABLES TRACKING / INVENTORY MANAGEMENT	<ul style="list-style-type: none"> ▪ Hospitals ▪ Clinics ▪ Laboratories ▪ EMS Providers ▪ Medical Device Manufacturers ▪ Pharmaceutical Firms 	<ul style="list-style-type: none"> ▪ Medical Supplies ▪ Surgical Trays ▪ Medication ▪ Controlled Substances 	<ul style="list-style-type: none"> ▪ Distributed inventory stores, often with excess inventory ▪ Labor-intensive inventory counting and documentation processes ▪ Product waste and risk to patient safety due to expired items 	<ul style="list-style-type: none"> ▪ Reduction in product inventory, waste ▪ More efficient staff allocation ▪ Streamlined documentation/recordkeeping
STAFF & PATIENT TRACKING	<ul style="list-style-type: none"> ▪ Hospitals ▪ Clinics 	<ul style="list-style-type: none"> ▪ Medical Staff ▪ Patients 	<ul style="list-style-type: none"> ▪ Over-scheduled staff ▪ Patients with high fall risk, flight risk 	<ul style="list-style-type: none"> ▪ Improved staff support, patient care ▪ Reduction in errors

2 MYTH: Asset tracking is for medical equipment

REALITY: Without a doubt, tracking the location and movement of medical equipment is an important part of asset tracking in healthcare. But asset tracking looks and behaves very similar to that in industrial applications. Both have capital equipment that needs to be tracked and traced; IT assets; consumables and supplies; tools; vehicles and transportation devices, and other digital orders.

And it's not just about tracking location. Since specialized equipment needs to be regularly calibrated, maintained and/or sterilized, updating a device's location along with its maintenance status helps ensure patient safety.



The following table lists examples of assets tracked with RFID in Healthcare:

Type of Asset:	Examples:
MEDICAL EQUIPMENT	<ul style="list-style-type: none"> ▪ Infusion Pumps ▪ Ventilators ▪ Wheelchairs ▪ Bariatric Equipment ▪ Physical Therapy Equipment ▪ Nebulizers
FACILITY EQUIPMENT	<ul style="list-style-type: none"> ▪ Power Generators ▪ Air Compressors ▪ Spare Parts
IT ASSETS	<ul style="list-style-type: none"> ▪ Laptops, Smartphones, Tablets ▪ Uninterruptible Power Supplies ▪ Network Servers
LABORATORY EQUIPMENT	<ul style="list-style-type: none"> ▪ Autoclaves ▪ Centrifuges ▪ Testing Equipment
MANUFACTURING ASSETS	<ul style="list-style-type: none"> ▪ Specialized Equipment ▪ Tooling ▪ Hazardous or Controlled Substances
CONSUMABLES, SUPPLIES & SPECIMENS	<ul style="list-style-type: none"> ▪ Medication ▪ Surgical Trays ▪ Medical Scrubs ▪ Medical Specimens

3 MYTH: RTLS is the only option for Asset Tracking in a Hospital.

REALITY: RTLS is a great technology for asset tracking, but it's far from the only one that makes sense in healthcare. As WiFi has become both ubiquitous in healthcare and demonstrates impressive gains in performance and security, it is widely used as infrastructure for asset tracking. Low-cost Passive RFID tags and readers are well-suited for managing distributed consumables inventory across a medical facility and in ambulances. Even GPS and traditional barcode technologies have their places in asset tracking, meaning that healthcare organizations with different on-staff expertise and budget levels can implement asset tracking in some form.

Tag Type	Operation & Range	Reader Infrastructure	Use Cases
UHF Passive RFID Battery-free tags	Tag powered by energy from RFID reader. Range : ~ 5 meters Theoretical infinite life	RFID readers at choke points, or handheld readers	Well suited for inventory mgt, areas/zones dedicated to a specific function: surgery, physical therapy, labs
Semi-Passive RFID Battery operated passive tags	Battery used to run microchip circuitry (not to communicate w/reader) Longer read range : ~20m (depends on battery)	Longer range; hence not necessary to use 'chokepoints'. Sensor data capture and storage. May require proprietary RFID readers.	Used where longer ranges are required, where sensor information (e.g. temperature) needs to be tracked with asset
Active RFID (RTLS) Battery operated	Tag beacons using onboard battery Long read range ~50-100m.	Long range; hence not necessary to use 'chokepoints'. Sensor data capture and storage.	Used where longer ranges are required, e.g. plant maintenance, storage yards, or where sensor information (e.g. temperature) needs to be tracked with asset Also used in cases where data storage on tags is required
WiFi Tags w/battery read by WLAN access points	Tags have a small processor, can have MAC address. Communicate with WLAN access points. Location accuracy between 5-10 meters.	Used where WiFi coverage exists, may require additional equipment to provide precise location. Triangulation done using access points.	Used where fully automated real-time asset visibility is required, for security, or for personnel, patient tracking

4 MYTH: RFID tags are expensive, so only high-value assets are tracked.

REALITY: RFID price tags have dropped dramatically in the past several years, and will continue to do so for years to come as quantities continue to grow.

RFID tags have a range of price points, depending upon the technology and application, from a few cents for consumables to more expensive tags for ruggedized applications requiring reliable operation in extreme temperatures or active RFID tags for tracking fleet vehicles.

In many cases, it's not just the price tag of the asset itself, but how often it is used, and how critical it is to daily operations that determines whether it is tagged, and tracked with RFID.

RFID TAG PRICE POINTS

Tag Type	Tag Costs
UHF Passive RFID Battery-free tags	Cost depends on packaging. Paper labels cost less than 10 cents per tag Ruggedized tags for surgical instruments can cost ~ \$5 per tag
Semi-Passive RFID Battery operated passive tags	Tag costs ~ \$10+ , plus replacement batteries
Active RFID (RTLS) Battery operated	Tag costs ~ \$25+ , plus replacement batteries
WiFi Tags w/battery read by WLAN access points	Tag costs ~\$50 , plus replacement batteries



5 MYTH: ROI is hard to quantify unless it's an enterprise-wide deployment.

REALITY: RFID's ROI has been well documented in a number of industries, including healthcare. The best way to generate faster ROI from RFID asset tracking is to apply it to high-impact business metrics

A high-impact metric involves an operational area that is that is directly related both the core business and the bottom line. Automating a high impact business process (especially one that is manual, costly and inefficient) with RFID or RTLS increases not just asset visibility, but the visibility of the project itself – which can lead to more corporate resources and support for your deployment. While it may be appealing to pilot RFID technology in an isolated area of your operation, this may not be the best approach in the long run.

HIGH-IMPACT BUSINESS METRICS - PRIMARY CARE PROVIDERS

Business Metric:	Quantifiable?:	Financial Impact;
EXCESS EQUIPMENT RENTAL DUE TO LOST, NON-COMPLIANT OR MISSING ASSETS	YES - using <ul style="list-style-type: none"> Monthly rental costs from 3rd party vendors Inventory levels compared year over year, adjusted for patient admission levels 	<ul style="list-style-type: none"> HIGH – often comprises a significant percentage of a hospital's operating budget
FINES FOR NON-COMPLIANCE DUE TO UNCALIBRATED, EXPIRED ASSETS, INCOMPLETE DOCUMENTATION	YES – using <ul style="list-style-type: none"> Total fines for non-compliance Total legal liability for Transportation 	<ul style="list-style-type: none"> HIGH – impacts an institution's reputation, investor sentiment, along with its financials
CONSUMABLES/ MATERIAL WASTE DUE TO EXPIRED MATERIALS, VACCINES, MEDICATIONS	YES , using <ul style="list-style-type: none"> Inventory value of scrap/discarded product Non-compliance fines, hazardous waste fees 	<ul style="list-style-type: none"> MEDIUM – lower cost assets
PATIENT SAFETY QUALITY RISK DUE TO MANUAL PROCEDURES	YES , using <ul style="list-style-type: none"> # of Critical Incidents per Month # of in-facility injuries per month Change in response times Fines paid for non-compliance, legal fees 	<ul style="list-style-type: none"> MEDIUM to HIGH – critical incidents have high visibility and can be costly

About OATSystems.

OATSystems has helped over 100 companies take advantage of RFID and RTLS to streamline operations, enhance customer satisfaction and increase bottom line results. OAT is the recognized Auto-ID solution leader with software that empowers businesses to achieve a competitive advantage and ROI from RFID & RTLS. As a pioneer in the development of Auto-ID technology, OAT has been setting the standard in RFID over the last decade and has provided RFID & RTLS-enabled solutions to leading companies such as Airbus, Monsanto, Bell Helicopter, the US Veterans Health Administration, Astrium, Parker Hannifin, Chevron, Kimberly-Clark, Teva Pharmaceuticals/Cephalon, Cessna, Shell and others. A division of Checkpoint Systems (NYSE:CKP), OATSystems is located in Waltham, MA, and has a development office in Bangalore, India and various direct sales offices and resellers around the globe.

Contact OATSystems today at www.oatsystems.com or 781-907-6100 and get ready to take control of your operations.

For specific information on Asset Tracking applications visit www.oatsystems.com/asset_tracking/index.php

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