Five Myths about RFID and RTLS in the Healthcare Industry

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. These can RFID and RTLS applications for 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.

This white paper debunks the leading myths about using RFID in the healthcare industry and will provide examples of how hospitals and other healthcare providers can successfully use the technology to improve their operations. The white paper will:

- Address the most common myths about RFID use in the healthcare industry;
- Provide an overview of the types of assets in the healthcare industry that can be tracked using RFID;
- Outline the varying RFID and RTLS options that can be used for asset tracking in a hospital;
- Provide examples of how RFID can be leveraged within healthcare operations to produce quantifiable business benefits beyond.

Myth 1: Asset tracking is for large hospitals

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	• Hospitals • Clinics • Laboratories • EMS providers • Media device manufacturers • Pharmaceutical firms	• Medical equipment • Testing equipment • Facilities equipment • Manufacturing equipment • IT assets	• High values assets, high cost of capital • Poorly-maintained assets can compromise quality of care and patient safety • Improved operational efficiency • High cost of compliance audits	• Significant reduction in duplicate inventory and rental equipment • More efficient staff allocation • Streamlined documentation / record keeping • Reduction in service parts inventory • Fewer manufacturing, logistics quality issues due to poorly maintained equipment
Temperature monitoring and sterilization	• Hospitals • Clinics • Laboratories • Media device manufacturers • Pharmaceutical firms	• Surgical instruments • Vaccines • Medical specimens • Perishable materials • Medical devices	• Labor-intensive paperwork, documentation processes • Risk of compromising patient safety, drug efficacy • Material waste • Risk of regulatory fines	• Improved processing time, without compromising safety • Streamlined documentation • Reduction in logistical errors, and associated costs • Increased efficiency and auditability
Consumables tracking / inventory management	• Hospitals • Clinics • Laboratories • EMS providers • Media device manufacturers • Pharmaceutical firms	• Medical supplies • Surgical trays • Medication • Controlled substances	• 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	• Reduction in product inventory, waste • More efficient staff allocation • Streamlines documentation / record keeping
Staff and patient tracking	• Hospitals • Clinics	• Medical staff • Patients	• Over-scheduled staff • Patients with high fall risk, flight	• Improved staff support, patient care • Reduction in errors

Myth 2: Asset tracking is for medical equipment

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 table on the right lists examples of assets tracked with RFID in Healthcare.

Type of Asset	Examples
Medical equipment	• Infusion pumps • Ventilators • Wheelchairs • Bariatric equipment • Physical therapy equipment • Nebulizers
Facility equipment	• Power generators • Air compressors • Spare parts
IT assets	• Laptops, smartphones, tablets • Uninterruptible power supplies • Network servers
Laboratory equipment	• Autoclaves • Centrifuges • Testing equipment
Manufacturing assets	• Specialized equipment • Tooling • Hazardous or controlled substances
Consumables, supplies and specimens	• Medication • Surgical trays • Medical scrubs • Medical specimens

Myth 3: RTLS is the only option for asset tracking

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 and 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 management, 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 with 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

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

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 determine whether it is tagged, and tracked with RFID.

Tag type	Tag cost
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 with battery, read by WLAN access points	Tag costs ~ $25+ , plus replacement batteries

Myth 5: ROI is hard to qualify unless it's an enterprise-wide deployment

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 to 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.

Business metric	Quantifiable?	Financial impact
Excess equipment rental Due to lost, non-compliant or missing assets	**Yes** - using • Monthly rental costs from 3rd party vendors • Inventory levels compared year over year, adjusted for patient admission levels	**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 • Total fines for non-compliance • Total legal liability for • Transportation	**High** – impacts an institution's reputation, investor sentiment, along with its financials
Consumables / material waste Due to expired materials, vaccines, medication	**Yes** – using • Inventory value of scrap/discarded product • Non-compliance fines, hazardous waste fees	**Medium** – lower cost assets
Patient safety Quality risk due to manual procedures	**Yes**, using • Number of critical incidents per month • Number of in-facility injuries per month • Change in response times • Fines paid for non-compliance, legal fees	**Medium to high** – critical incidents have high visibility and can be costly

About the Sponsors

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. More information on OAT Aerospace Applications may be found at www.oatsystems.com and on Twitter at @OATSystems.

Xerafy's innovations have changed the price-performance ratio for RFID tags and made it possible for customers to track assets in a wide range of harsh environments. Xerafy provides read-on-metal tags that can be embedded directly into assets to meet a full range of needs for RFID asset tracking in the aerospace, industrial, data center, healthcare, energy and other industries. Xerafy is headquartered in Hong Kong and maintains U.S. sales and support offices in San Jose, Dallas and Minneapolis, and additional offices in the U.K. and China. Learn more about Xerafy's Aerospace expertise by visiting www.xerafy.com/en/application/healthcare and on Twitter at @Xerafy.