# Using RAIN RFID Technology to Attain Data-Driven Inventory Optimization:
## Case Study from a Level-I Trauma Center in California

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### Background of the Problem

There are tens of thousands of medical products needed for thousands of types of procedures and for very different patients with unique needs. There are a tremendous number of devices and supplies on the market, many of which are stocked at hospitals; unfortunately, these products are not necessarily being tracked inside the facilities or even to a specific patient, despite limited shelf life and being subject to possible recalls. Without accurate information about which items are needed for patient care, whether they're in stock, where they're located in the hospital, and whether or not they've expired or been recalled, there are tremendous inefficiencies and risks to patients. In addition, clinical staff commonly have to use outdated, manual systems to document items used on a patient, leading to errors in medical records and billing, and distracting them from focusing on patients. Any breakdown in the supply chain affects patients directly by putting them at risk. Certainly, we all witnessed these consequences with the PPE shortages last year.

The health care supply chain is riddled with massive waste due to the failure of hospitals to have an optimized and lean inventory. Supply chain costs are one of the primary expenses for hospitals, and particularly impact institutions with a high CMI index, such as large academic medical centers with busy interventional departments. Such departments (cath labs, interventional radiology, EP, OR, GI/endoscopy) are areas where the majority of supply expenses occur, and where consumable supplies and implants constitute an essential part of the patient care process. Nevertheless, most departments lack both visibility and operational control over their supply spend and levels of waste, as well as accurate utilization data and effective inventory management tools and practices. Actionable metrics or KPIs are essential for showing the relationship between supply purchases and clinical and operational performance, and thus keeping supply costs

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under control. When used together with RAIN (RAdio frequency IdentificatioN) RFID data capture technology, KPIs provide hospitals with the data visibility needed to guide and achieve inventory optimization, prevent waste and control supply spend.

### Case Study Overview

In January 2017, a RAIN RFID-based technology was implemented, together with optimization software, in the cardiothoracic surgery department of a Level-I Trauma Center in California in order to capture and disseminate UDI-compliant data. The implementation team worked closely with the department's leadership, supply chain, IT and finance to put the tools in place, build ERP and EPIC billing interfaces and establish financial and operational oversight. The project's goal was to gain full visibility and control over supply spend and utilization to reduce supply purchases and waste levels, optimize inventory size and composition, reduce unnecessary variation and ensure full charge capture.

This RAIN RFID solution used UHF RFID readers, zonal and steerable BESPA antennas, and GS1 Gen 2 passive UHF RFID tags that continuously and automatically track the movement and location of all tagged supplies without the need for human intervention or special cabinetry. RAIN RFID ensures the accurate data capture of every item coming in and going out of the department as well as used at the point of care; this data is then reported to the Cloud. The power of the Cloud lies in its ability to store, compute, analyze and report tremendous amounts of data with easy user access, and to help turn data into actionable information. The ERP and EPIC interfaces ensured streamlined processes for clinicians to capture and document UDI data, for supply chain staff to efficiently manage inventory, reorders, and expirations,

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and for administrators to monitor overall
utilization, costs and contract compliance. In
August 2018, monthly KPIs were instituted to
track changes in inventory levels, purchases,
utilization, cost per SKU, unused and wasted
inventory, items above necessary par levels
and other metrics.

### Case Study Results

Prior to implementation, fewer than 50% of
cases had their supplies captured accurately due
to manual supply documentation, and greater
than 50% of items on hand had no traceable,
correlated purchase history. There were no tools
in place to address these problems and little
coordination between clinical, supply chain,
finance and IT.

The combination of KPIs, RAIN RFID, optimization
software, and Cloud analytics led to many
significant results: expired items have been
maintained at <1% of total inventory value; unused
inventory and inventory above recommended par
levels have been reduced by >60%; and billing
accuracy is now >90%. Items are now being
tracked from receipt to patient 24/7 with a
perpetual inventory management system; data
capture of clinical supplies for patient charges
has been automated; and purchases have been
aligned with consumption needs. Patient safety
has also improved significantly: recalled products
are now traced to patients within seconds;
expired devices are never used; products are
guaranteed to be available; and patient medical
records are always accurate.

### Conclusion

RAIN RFID is an incredibly potent tool for
achieving supply chain transparency and
inventory optimization through the collection
of essential data. And information truly *is*
power—the power to analyze and decide, to
make changes and adapt and to succeed and
excel. This case study shows how hospitals are
empowered through meaningful and actionable
data—data that is generated in real time with
automated RAIN RFID technology and then
analyzed and turned into actionable information
using Cloud computing.