INTEGRATION, INC.
*Going Beyond The Mark!™*

# CREATING BETTER VISIBILITY ACROSS HEALTHCARE OPERATIONS A GUIDE TO RFID, AUTOMATED DATA CAPTURE & CONNECTED WORKFLOWS

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# SOLUTIONS GUIDE

**BETTER VISIBILITY. SMARTER WORKFLOWS. BETTER DECISIONS.**

13024 Beverly Park Road, Suite 104, Mukilteo, Washington 98275

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# INTRODUCTION – BETTER VISIBILITY STARTS WITH THE WORKFLOW

Hospitals today are under immense pressure to operate more efficiently while delivering the highest standard of patient care. Staff shortages, rising costs, and outdated manual processes are stretching resources thin. In this environment, inefficiencies like misplaced equipment, inventory shortages, and compliance risks not only waste time and money but can also put patient safety and satisfaction at risk.

Healthcare operations depend on the movement of physical items and the information associated with them. Equipment needs to be available when clinicians need it. Inventory needs to be visible and accurate. Surgical trays and specimens need to move through defined workflows. Medical device data needs to reach the systems that depend on it. When those physical workflows and information systems become disconnected, staff are often left filling the gaps through manual searches, counts, documentation, and data entry.

Automated data capture technologies can reduce the manual effort required to identify, locate, count, and document physical items as they move through healthcare operations.

The right technology depends on what the workflow needs to know. Passive RFID can automatically identify tagged items at configured read points without line-of-sight scanning. Handheld RFID can help staff search for specific tagged items. RTLS can support workflows that require more frequent location awareness. Intelligent barcode scanning can capture, validate, parse, and format data at the point of capture.

The technology is only one part of the solution. Useful visibility also depends on the physical environment, infrastructure, workflow design, system connections, and the way captured information is delivered to the people and applications that need it.

In this guide, we'll look at common healthcare operational challenges and explore how RFID, automated data capture, and connected systems can create better visibility across those workflows.

**"84% OF DECISION-MAKERS AGREE THAT MANAGING INVENTORY DIRECTLY IMPACTS PATIENT SAFETY."**

**– ZEBRA TECHNOLOGIES, HOSPITAL VISION STUDY**

# CHALLENGES HOSPITALS FACE TODAY

Running a modern hospital is no small feat. From managing critical inventory to coordinating patient care, healthcare facilities operate under intense pressure to deliver safe, high-quality care in an environment often constrained by limited resources. Yet, outdated systems and manual workflows can create significant inefficiencies, putting both patients and staff at risk.

Below, we explore some of the most pressing challenges hospitals face today—and how these obstacles impact operations, staff, and patient outcomes.

## INVENTORY SHORTAGES, WASTE, AND VISIBILITY GAPS

For hospitals, maintaining an accurate inventory of medical supplies, pharmaceuticals, and surgical tools is critical—not just for operational efficiency, but also for patient safety. Yet many hospitals still rely on manual inventory counts and disconnected systems that result in avoidable mistakes.

### THE CONSEQUENCES

- **Shortages and Stockouts**: Essential supplies may be unavailable when needed most, causing procedure delays or cancellations.

- **Expiration and Recall Visibility**: Without proper tracking, expired or recalled items may inadvertently be used, jeopardizing compliance with FDA regulations and patient safety.

- **Excess Inventory and Waste**: Overstocking to "play it safe" leads to unnecessary costs and waste.

**"74% OF HOSPITALS REPORT CANCELED PROCEDURES DUE TO LOW-STOCK OR OUT-OF-STOCK SUPPLIES, UNDERSCORING THE CRITICAL NEED FOR BETTER INVENTORY MANAGEMENT."**

**– ZEBRA TECHNOLOGIES, HOSPITAL VISION STUDY**

## LIMITED VISIBILITY INTO EQUIPMENT AVAILABILITY

Every hospital depends on an intricate web of high-value assets, from ventilators and infusion pumps to wheelchairs and sterilized surgical tools. However, the lack of real-time visibility into these assets means staff often waste hours searching for equipment—or worse, go without it.

### THE CONSEQUENCES

- **Delays in Patient Care**: Missing equipment can stall surgeries, extend wait times, or disrupt procedures.

- **Increased Costs**: Hospitals may overstock or rent equipment unnecessarily to compensate for misplaced or unavailable assets.

- **Staff Frustration**: Clinical teams face growing frustrations when critical tools aren't readily accessible, leading to inefficiencies and burnout.

## OVERCOMING DATA SILOS IN HEALTHCARE

Capturing information is only useful when that information can reach the systems and people that need it. Disconnected asset, inventory, clinical, and enterprise systems can leave staff working from incomplete or inconsistent information.

### THE CONSEQUENCES

- **Operational Bottlenecks**: Fragmented systems lead to delays in critical workflows, such as patient discharges or equipment allocation.

- **Inaccurate Resource Allocation**: Without real insights, equipment, staff, and beds cannot be dynamically assigned to meet patient needs.

- **Reactive Management**: Hospitals are forced to respond to crises rather than proactively addressing inefficiencies.

**IN 2023, 18% OF SENTINEL EVENTS RESULTED IN PATIENT DEATH, WHILE 88% OF ALL SENTINEL EVENTS OCCURRED IN HOSPITAL SETTINGS. PATIENT FALLS, UNINTENDED RETENTION OF FOREIGN OBJECTS, AND DELAYS IN TREATMENT WERE AMONG THE LEADING CONTRIBUTORS.**

**– THE JOINT COMMISSION**

*A lack of real visibility into critical resources, including equipment and supplies, increases operational costs and disrupts workflows, resulting in inefficiencies across the hospital.*

## ADMINISTRATIVE BURDENS TAKE TIME AWAY FROM HIGHER-VALUE WORK

Healthcare staff are often responsible for time-consuming non-clinical tasks such as locating equipment, counting inventory, documenting supply usage, and reconciling information across disconnected systems. Each individual task may seem small, but repeated throughout a shift, manual work can consume valuable staff capacity.

### THE CONSEQUENCES

• **Less Time for Patient Care**: Time spent searching for equipment or completing avoidable manual tasks is time that cannot be directed toward clinical care and other higher-value responsibilities.

• **Staff Frustration**: Repeated searches, manual documentation, and workarounds create unnecessary friction in already demanding healthcare environments.

• **Lost Productivity**: Highly skilled employees spend valuable time completing tasks that can often be reduced through better visibility and automated data capture.

### THE OPPORTUNITY

Better visibility can reduce the time staff spend searching, counting, documenting, and reconciling. The goal is not simply to automate individual tasks. It is to give healthcare teams more reliable information with less manual effort.

NURSES SPEND AN AVERAGE OF 21 MINUTES PER SHIFT SEARCHING FOR EQUIPMENT, WITH REPORTED SEARCH TIMES RANGING FROM 21 TO 60 MINUTES.

– HIMSS, APPLYING RTLS TECHNOLOGY TO IMPROVE NURSE EFFICIENCY AND PATIENT CARE

# MATCH THE TECHNOLOGY TO THE VISIBILITY REQUIREMENT

## HOW RFID & AUTOMATED DATA CAPTURE IMPROVE HEALTHCARE OPERATIONS

Hospitals depend on accurate information about equipment, inventory, specimens, and other physical workflows. When that information depends on manual searches, counts, or data entry, visibility gaps can create unnecessary work and make timely decisions more difficult.

RFID and automated data capture technologies can reduce manual effort by capturing information as part of the workflow. The right approach depends on what needs to be identified or located, how frequently information is needed, and where that information needs to go.

## MATCHING THE TECHNOLOGY TO THE WORKFLOW

Passive RFID can automatically identify tagged items at configured read points without line-of-sight scanning. Handheld RFID can support inventory and proximity-based searches. When a workflow requires more frequent location awareness, RTLS may be appropriate. Intelligent barcode scanning can capture and process structured data such as FDA UDI information.

**KEY BENEFITS**

- Automate data capture at meaningful points in equipment, inventory, specimen, and surgical workflows.
- Improve asset and inventory visibility using technology matched to the required frequency and level of location information.
- Connect captured data with existing systems so useful information can support downstream workflows and decisions.

## ENHANCING PATIENT SAFETY

Better visibility into critical items and workflow events can help healthcare teams reduce preventable delays and identify problems earlier. Automated data capture can support more reliable identification and documentation while reducing dependence on manual processes.

**KEY BENEFITS**

- Support specimen chain-of-custody workflows by automatically recording tagged specimens at configured read points.
- Improve visibility into the movement and availability of equipment and other critical resources.
- Reduce delays associated with searching for equipment, supplies, specimens, or other tagged items.

## OPTIMIZING INVENTORY MANAGEMENT

Manual inventory processes can be time-consuming and make it difficult to maintain an accurate picture of what is available. Automated data capture can improve inventory visibility, support expiration and recall workflows, and provide more reliable information for replenishment and purchasing decisions.

**KEY BENEFITS**

- Automate inventory capture to reduce reliance on manual counts and improve inventory accuracy.
- Use captured product and expiration data to support expiration and recall management.
- Capture, validate, parse, and format FDA UDI barcode data for use by receiving hospital systems.

## REDUCING ADMINISTRATIVE WORKLOADS

Automated data capture can reduce the manual work required to identify, count, locate, and document physical items. By capturing information as part of the workflow, hospitals can give staff better visibility while reducing time spent on repetitive searches, counts, and data entry.

**KEY BENEFITS**

- Reduce time spent searching for equipment and other tagged items.
- Automate inventory and usage data capture where the workflow supports it.
- Connect captured information with existing systems to reduce duplicate data entry and manual reconciliation.

## SUPPORTING WORKFLOW EFFICIENCY

Visibility gaps can create delays as equipment, inventory, surgical trays, specimens, and information move between people, departments, and systems. Automated data capture can provide timely information at important workflow points, helping teams identify bottlenecks and improve how resources move through the organization.

**KEY BENEFITS**

- Improve visibility into surgical tray movement and availability across defined workflow points.
- Support faster equipment search and recovery when needed assets cannot be readily located.
- Create more reliable workflow data that can be used to identify delays and opportunities for improvement.

# USE CASES: RFID IN ACTION

**Explore how RFID technology is driving measurable improvements in healthcare operations, from tracking specimens to managing sterilized surgical trays and automating inventory workflows.**

## PRIMARY BENEFITS

- Better Handoff Visibility
- Automated Event Capture
- Less Manual Scanning
- Faster Specimen Search
- Connected Workflow Data

## CREATING BETTER VISIBILITY ACROSS SPECIMEN HANDOFFS WITH RFID

Specimens move through multiple collection, transport, intake, storage, and processing steps, creating opportunities for visibility to be lost between handoffs. When a specimen cannot be readily located, staff may need to spend valuable time retracing its path and searching for it.

Passive RFID can add automated data capture at meaningful points in the specimen workflow. Tagged specimens can be detected as they pass configured read points, creating a record of observed movement without requiring a line-of-sight scan. If a specimen cannot be located, handheld RFID can also help staff search for the specific tagged item.

## HOW IT WORKS

**RFID Tags**

Specimen containers are identified with passive RFID labels at the collection point, allowing each tagged specimen to be recognized throughout the configured workflow.

**Fixed RFID Readers**

Readers positioned at meaningful workflow points, such as lab intake or processing areas, can automatically record tagged specimens as they pass through the configured read zone.

**Handheld RFID Readers**

When a tagged specimen cannot be readily located, staff can use a handheld reader to search for the specific item. Proximity feedback becomes stronger as the reader gets closer to the selected tag.

## WHY IT MATTERS

Specimen visibility is closely connected to workflow reliability and patient care. When a specimen is delayed or cannot be readily located, staff need a reliable way to determine where it was last observed and investigate its location. By combining passive RFID identification, strategically configured read points, handheld search, and connected systems, healthcare organizations can create better visibility across specimen handoffs while reducing reliance on manual processes.

# IMPROVING VISIBILITY INTO HOSPITAL EQUIPMENT WITH RFID

Hospitals depend on mobile equipment moving between departments, patient care areas, storage locations, and other spaces throughout the facility. When equipment cannot be readily located, staff may spend valuable time searching or turn to unnecessary rentals and purchases.

Passive RFID can improve equipment visibility by automatically identifying tagged assets at configured read points. Handheld RFID also gives staff a practical way to search for a specific tagged asset when its exact location is unknown.

## PRIMARY BENEFITS

- **Faster Equipment Search**
- **Better Asset Visibility**
- **More Efficient Inventories**
- **Reduced Search Time**
- **Better Asset Utilization**

## HOW IT WORKS

**RFID Tags**

Equipment is identified with a passive RFID tag that allows each asset to be recognized by the system.

**Fixed RFID Readers**

Readers installed at configured locations automatically record tagged equipment when it is observed within the defined read zone.

**Handheld RFID Readers**

Staff can conduct inventories or search for a specific tagged asset using proximity feedback to help narrow the search.

**Centralized Software Integration**

RFID data can be integrated with the hospital's asset management system, giving staff centralized access to equipment location history, status, and other captured asset information.

## WHY IT MATTERS

Better equipment visibility can reduce the time staff spend searching for assets and provide more reliable information about equipment movement and availability.

For workflows that require more frequent location updates or greater location precision, RTLS can provide an additional level of location awareness.

# IMPROVING SURGICAL TRAY VISIBILITY WITH RFID

Surgical trays move through a complex cycle of assembly, sterilization, storage, staging, transport, use, and reprocessing. Once a tray has been sterilized and wrapped, perioperative teams need a reliable way to identify it without opening the sterile packaging and compromising sterility.

That becomes especially important as teams prepare for scheduled procedures. Staff need confidence that the right tray is available for the right case, while also knowing where needed trays are within the workflow. Limited visibility can lead to additional searches, manual verification, delays, and uncertainty when preparing for a procedure.

Passive RFID provides a way to identify tagged surgical trays without requiring line-of-sight scanning or opening the sterile wrap. RFID read points can automatically capture tagged trays at meaningful workflow transitions, while handheld readers can help staff identify or search for a specific tray when needed.

## PRIMARY BENEFITS

- Better Tray Visibility
- Faster Tray Search
- Automated Event Capture
- Improved Availability
- More Reliable Records

## HOW IT WORKS

**Durable RFID Identification**

Each surgical tray is identified with a durable RFID tag that can be recognized throughout the configured workflow.

**Automated RFID Read Points**

Readers positioned at meaningful workflow locations can automatically record tagged trays as they move through defined read zones.

**Handheld RFID Search**

Staff can use handheld RFID readers to identify trays, conduct inventories, or search for a specific tagged tray.

**Connected Workflow Data**

Captured RFID events can be connected with hospital systems to provide useful information about tray movement, status, and availability.

## WHY IT MATTERS

Reliable tray visibility can help perioperative and sterile processing teams spend less time searching for needed trays and provide better information about where trays have been observed within the workflow. Automating identification at meaningful handoff points also creates more consistent workflow data that can support operational improvement over time.

## IMPROVING VISIBILITY INTO HIGH-VALUE INVENTORY WITH RFID

Hospitals manage implants, medical devices, and other high-value supplies that need to be available when clinicians need them while also being carefully managed for cost, expiration, and replenishment. When visibility depends on manual counts and disconnected records, it can be difficult to maintain an accurate picture of what is actually on hand.

RFID can automate the identification of tagged inventory at meaningful points in the workflow, giving healthcare teams more timely and reliable information about inventory activity. Better visibility can help staff identify what is available, reduce time spent on manual counts, monitor products approaching expiration, and make more informed replenishment decisions.

For consigned and other high-value inventory, that improved information can also support stronger coordination between hospitals and suppliers while giving the organization greater visibility into inventory it is responsible for managing.

## PRIMARY BENEFITS

- Better Inventory Accuracy
- Reduced Manual Counts
- Expiration Visibility
- Improved Replenishment
- Consignment Visibility

## HOW IT WORKS

**Identify**

High-value inventory is uniquely identified using RFID tags appropriate for the item and environment.

**Capture**

RFID readers capture tagged inventory at configured locations or workflow points without requiring individual line-of-sight scans.

**Update**

Captured inventory activity is connected with the appropriate software and hospital systems to maintain more current inventory information.

**Act**

Teams can use improved inventory information to support counts, replenishment, expiration management, and other inventory decisions.

## WHY IT MATTERS

High-value inventory ties up significant resources and can create both operational and financial consequences when records do not accurately reflect what is available.

Better inventory visibility gives healthcare teams more reliable information for managing availability, expiration, replenishment, and utilization while reducing the manual effort required to maintain inventory records.

## TURNING UDI BARCODES INTO RELIABLE HOSPITAL DATA

Medical device barcodes can contain multiple UDI data elements that need to be captured accurately and delivered in a format the hospital's systems can use. Inconsistent barcode quality, unexpected data, and differences in how information is encoded can create additional work for hospital staff and introduce errors into downstream workflows.

BarCode$^{OS®}$ adds processing capabilities within the barcode scanner itself. As a barcode is scanned, the captured data can be validated against configured rules, parsed into the required elements, formatted appropriately, and transmitted to the receiving application. When problems are identified, the resulting information can also support feedback to suppliers and help address recurring barcode quality issues.

## PRIMARY BENEFITS

- Reduce Manual Entry
- Improve Data Quality
- Identify Barcode Issues
- Strengthen Supplier Accountability
- Standardize UDI Data

## HOW IT WORKS

**UDI Validation with Smart Scanners**

BarCode$^{OS®}$ can evaluate captured UDI barcode data against configured rules at the point of scanning, helping identify missing, unexpected, or improperly formatted data before it moves downstream.

**Error Reporting & Feedback**

When barcode data does not meet configured requirements, the workflow can flag the issue and provide actionable information for follow-up rather than allowing bad data to pass unnoticed.

**Supplier Accountability**

Documented barcode issues give hospitals information they can use to identify recurring problems and work with suppliers to improve barcode quality and data consistency.

**Seamless Data Parsing**

When a UDI barcode is valid, it automatically parses the data into the correct hospital ERP, EHR, or inventory system, eliminating manual entry.

## WHY IT MATTERS

Hospitals shouldn't have to fix supplier mistakes or deal with the frustration of mislabeled medical products. BarCode$^{OS®}$ ensures that only properly formatted UDI barcodes enter hospital systems, preventing costly errors and allowing staff to focus on patient care instead of data correction.

By automating UDI validation, hospitals can eliminate compliance headaches, improve supply chain accuracy, and demand better performance from suppliers—all with just a scan.

## SUPPORTING RECALL AND EXPIRATION MANAGEMENT WITH RFID

When a medical product is recalled or approaching expiration, healthcare teams need reliable information about which inventory is affected and where those items may be located. Inaccurate inventory records and manual search processes can make that work more time-consuming.

RFID can improve the inventory visibility that supports recall and expiration workflows. Tagged items can be identified at configured locations, while handheld RFID gives staff a way to search for specific affected inventory. Connected inventory data can also help teams identify products requiring attention and document follow-up activity.

## PRIMARY BENEFITS

- Faster Product Search
- Better Inventory Visibility
- Expiration Awareness
- Recall Support
- Improved Documentation

## HOW IT WORKS

**RFID-Enabled Inventory Visibility**

RFID captures tagged inventory at configured locations, creating more reliable information about what inventory has been observed and where.

**Expiration Monitoring**

Captured product and inventory data can support workflows that identify items approaching expiration so staff can take appropriate action.

**Recall Identification**

When affected products are identified through the hospital's recall process, inventory information can help determine whether those items may be present in the organization.

**Targeted Product Search**

Handheld RFID can help staff search for specific tagged items, reducing the time required to locate affected inventory for follow-up.

## WHY IT MATTERS

Recall and expiration management depend on both accurate product information and the ability to find affected inventory. Better visibility can help healthcare teams respond more efficiently, reduce manual search effort, and maintain stronger documentation of the actions taken.

# BUILDING THE RIGHT APPROACH FOR YOUR WORKFLOW

Healthcare visibility challenges rarely begin with a specific technology. They begin with an operational need: finding critical equipment, improving inventory accuracy, identifying sterile surgical trays, strengthening specimen handoffs, or capturing more reliable product data.

ID Integration brings more than 25 years of systems integration experience to these challenges, connecting data-capture technology, infrastructure, software, and existing systems around the requirements of the workflow.

### 1 Assess

Map the workflow, identify visibility gaps, and assess the environment.

### 2 Design

Connect the right technology, infrastructure, and systems.

### 3 Implement

Deploy, test, and train.

### 4 Optimize

Measure performance, refine, and expand.

From passive RFID and RTLS to intelligent barcode capture and connected systems, ID Integration brings together the technologies and integration expertise needed to create useful visibility across healthcare operations.

The result is a solution designed around the environment, the systems it needs to connect with, and the people who rely on the information it produces.

# READY TO IMPROVE VISIBILITY ACROSS YOUR HEALTHCARE WORKFLOWS?

(425) 348-2533

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# SOURCE LINKS


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