

The Use of RFID for Asset Management, Risk Mitigation and Enhanced Financial Performance in the Healthcare Industry

Introduction

The healthcare industry has been challenged over the last few decades to maintain its viability as a provider of quality services, while being increasingly encumbered by costly regulatory requirements and escalating expenses. The industry must find solutions that support corporate governance and maintain quality of service, while improving operating efficiencies and lowering the cost of operations.

The advent of cost effective data capture technologies, combined with the increasing availability and affordability of information and communications networks within most healthcare facilities, now makes improving the accuracy of billing and revenue capture, optimizing the use of existing assets and improving operating efficiencies achievable.

The heart of the solution is to use low-cost passive RFID (radio frequency identification) tags. These can be placed on equipment, files and critical assets to track their locations in and around medical facilities. The tags are read by electronic sensors placed at strategic locations in a facility, with embedded information on tags being transmitted to central databases for item identification and location verification.

The application of similar technology to RFID identification wristbands enables medical facility operators to read, write, lock or delete information on the wristbands in order to track procedures and dispensation of medication, and provide instructions and alerts. The data can be read and used to capture all procedures that are performed and all medications that are dispensed. The data can then be electronically input directly into accounting and billing systems. Enhanced data capture improves revenue and billing accuracy, and information is secure and confidential because of the system's architecture and encoding techniques, and the application of overlaying password access control.

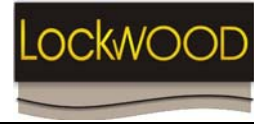
The benefits of using RFID in the healthcare environment with respect to asset management, billing and revenue, patient safety, and regulatory compliance are discussed below.

Operating Efficiencies and Cost control

Operating efficiencies, and to a lesser extent cost control, revolve around the optimization of the use of assets. Effective asset management, therefore, can be a critical factor in patient safety and recovery, and in controlling operating costs. For example, a common problem healthcare institutions face is being able to locate and access portable bio-medical devices such as IV pumps and defibrillators, since medical staff frequently hide or hoard equipment they perceive might be needed in emergency situations.. Institutional response to this is often to purchase more devices than operational needs require, resulting in higher costs, excess equipment and lower ROI.

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Other operating inefficiencies occur with non-critical, but nevertheless important, mobile equipment such as gurneys and wheel chairs. These expensive devices are often left by staff and patients in inappropriate locations, with the result that institutions again have to over-purchase the equipment.

Aside from over-purchasing equipment, institutions often hire dedicated staff to monitor and track down these devices – all at a non-billable cost to the institution.

Further complicating the ineffective use of assets is the need to continually clean, sterilize and certify equipment. Locating the equipment is one issue. Maintaining a schedule of cleaning and sterilizing equipment, and knowing when leased and depreciated equipment needs to be replaced is, in another challenge.

A central theme in the solution to all these operational problems is knowing what equipment is located where. RFID tagging with strategically located tag readers can do this. Software can integrate in near real-time the data collected by fixed location readers or hand held devices (such as PDAs and laptops) with virtually all existing database programs. The solution is therefore easy to install in a cost effective way and interfaces with stand-alone databases or SAP, Oracle, Lawson, Peoplesoft, JD Edwards, etc. As a result, no major operational changes or technology database changes are required.

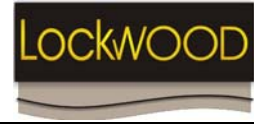
Event management software, which is transparently imbedded in the RFID application, can be used in a variety of ways – from sending notification of the movement of equipment from one location to another, to sending alerts when physical file folders are removed from specific locations. The same capability can be used to notify corporate controllers or asset managers of service and cleaning schedules, and equipment replacement cycles.

Billing, Procedure Capture and Revenue Enhancement

Providing healthcare is a complex business with many back office procedures standardized to meet regulatory, legal, insurance and billing requirements. The result is that there are standard forms and processes pervasive in the healthcare industry that relate to procedures, confidentiality of patient data, billing, insurance and governmental reimbursements.

Two of the most important forms are the CCR (continuity of care record), which includes information relating to a patient and is always electronically submitted and shared between disparate data systems in XML format. The second form is the CDM (charge description master). This form is the master information repository that cross references unique reference codes to procedures, medication and patient care. The CDM links the codes to a procedure or medication description, and to corresponding charges for billing, insurance and accounting purposes.

The reference codes are read by transaction processing systems using the CDM as the basis for data capture.



Problems arise when paperwork is misplaced or lost, codes are manually entered incorrectly on the CDM, or medical procedures and the dispensing of medication is incorrectly recorded, or not recorded at all. These issues all adversely impact billing, insurance reimbursement and the accurate recording of procedures. The result is that patient care is not fully recorded, with the usual outcome being that expenses are not fully recovered and there is generally under-billing for services. The loss of revenue in some institutions is estimated to be as high as 20%.

Using RFID wristbands, patient procedures can be recorded as they occur. A simple method of entering data wirelessly from readily available PDAs or laptop computers is all that is needed. Access to information on the wristband is secure and limited to authorized professionals. All of the CCR and CDM information can therefore be accurately read to insurance, accounting and billing databases. As with the asset management RFID tags discussed above, the integration software incorporated into the system interfaces with existing database programs, obviating the need for and expense of changing systems.

Patient Safety and Wellbeing

There is a direct correlation between record keeping and patient wellbeing. Record keeping starts with patient registration, continues through patient medical care activities and ends with business, financial, insurance and billing issues.

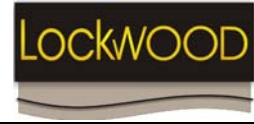
Manual patient records are subject to mishandling, are frequently misplaced and often are not available to all medical staff who need access to them. The consequences may include the misapplication of medications, performance of incorrect medical or surgical procedures or mis-recording of information. All of these events can lead to disastrous consequences for patients and create difficult legal, insurance and business environment for healthcare institutions.

Two applications of RFID technology improve the accuracy of record keeping that result in enhanced customer safety and minimized misapplication of procedures. These are 1) the use of RFID tags on patient files so that they can be tracked and easily located when needed, and 2) imbedding all appropriate information required for patient-handling, medical procedures and care cycles into RFID wristbands so that information can be input and read as needed.

Information related to patients' whereabouts, what procedures need to be performed or have been performed, past medical history, allergies, alerts, etc. can be imbedded in wristbands that patients wear at all times. As a result, patient safety and wellbeing is enhanced by the same technology that improves the financial and operational performance of the healthcare provider.

Regulatory Compliance

Healthcare organizations are strictly governed by several federal organizations, including JACHO and HIPPA. These oversight boards ensure the industry rules and legal



regulations are followed as they relate to patient care and safety, that healthcare standards are followed, and that corporate and operating governance is adequate.

These organizations also act to certify the eligibility of healthcare providers and procedures for reimbursement for capital expense outlays through Medicare. If healthcare providers fail JACHO and HIPPA audits the consequences are dire, including losing the right to obtain medical expense reimbursement.

Accurately tracking and accounting for capital equipment becomes an import issue for regulatory compliance, passing regulatory authority audits and recovering costs associated with asset purchases. For public companies confronted with Sarbanes–Oxley issues, the benefits of accurate asset tracking are further compounded.

Using RFID asset tracking technology to ensure the integrity of organization and accuracy of patient record keeping represents a monumental cost-effective leap forward in improving operating efficiencies, financial performance and regulatory compliance.

Risk Mitigation

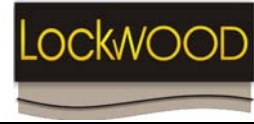
General and professional liability (GL/PL) charges cost healthcare service providers up to 25% of their Medicaid reimbursement funds. An additional 50% of the GL/PL costs are paid out in professional fees for litigation. Litigation arises from a variety of healthcare provider actions or non-actions, many of which could be rectified with more effective asset management and record keeping.

Equipment certification is an example of how GL/PL and litigation costs can be reduced by the risk mitigation capabilities of RFID technologies. Using RFID asset tagging coupled with event management software, technicians and controllers can be alerted to what equipment is required to be inspected, cleaned and certified according to schedule. Healthcare providers can ensure that equipment inspection and certification is compliant with regulations and equipment maintenance requirements – eliminating the basis for litigation based on the use of non-compliant equipment in certain medical procedures. Equipment certification applies equally to existing equipment on a maintenance schedule and to new equipment coming into use at a facility. Pre-tagged new equipment will not readily slip into usage without inspection and certification, as often happens with manual processes when procurement departments, medical practitioners and controller’s offices have a communications disconnection.

RFID-based asset management and record keeping, therefore, go a long way toward mitigating risk and the underlying basis for GL/PL and litigation costs.

Financial Considerations

With the advent of wireless networking capability and advances in RFID technology, the hardware costs of systems have come down dramatically in recent years. In fact, most equipment such as laptops, antennae, fixed and portable RFID readers and network gear are now standard off-the-shelf items.



With the use of backend integration, and data and event management software such as Lockwood Technologies' QuickTrac system - which interfaces with existing industry standard databases - no major database program replacement is required, enabling a quick implementation of RFID asset management technologies with minimum disruption to existing operations.

Because the same hardware and backend software can be used for barcode data capture and RFID tags, transition from barcode technology to RFID asset management, with its dynamic asset tracking, is seamless and remains cost effective. This capability also makes the transition to RFID modular and highly scalable.

The cost of purchasing integration management and event notification software is extremely low compared to the cost savings from not having to acquire excess assets, and lowering GL/PL and litigation charges. As a result, implementation of RFID technology has an extremely high ROI, independent of the benefits of enhanced regulatory compliance and improved patient safety and customer care.

Complete, fully installed portable RFID systems can cost as little as the equivalent of a handful of IV pumps, and as much as several hundred thousand dollars for large-scale enterprise-wide licenses. In either case, the ROI is compelling.

Lockwood's proprietary software fully integrates RFID and barcode data capture with existing databases. Lockwood has progressively developed its technology and products over 15 years. There are over 1,200 worldwide users of Lockwood's asset management technologies to track assets and inventories, support audits and improve operational readiness and efficiency. For further information, please visit www.lockwoodtechnology.com