

United Kingdom

End-to-end product traceability enables safer, more efficient care for Lancashire

Challenge

Stock control was heavily reliant on manual processing, and orders and supplies were managed by a limited number of staff. Much of the inventory management responsibilities would fall to individual nurses, taking them away from providing direct patient care.

Storage and inventory control was not centralised so clinical staff would take products from main stores to create their own independent, localised stores. This led to an excess of 40 disparate locations spanning everywhere from ward cupboards to desk drawers so it was hard to get one view of stock across the hospitals.

Approach

Ingenica's inventory management system (IMS) was implemented to help manage stock control. The IMS is kept up to date with information provided directly by suppliers via the GHX Nexus catalogue. Product information including the unique Global Trade Item Number (GTIN) is then fed directly into the IMS. This then allows products to be accurately identified, tracked, and traced across multiple locations to provide the transparency and visibility needed to improve stock control centrally.



Stock control



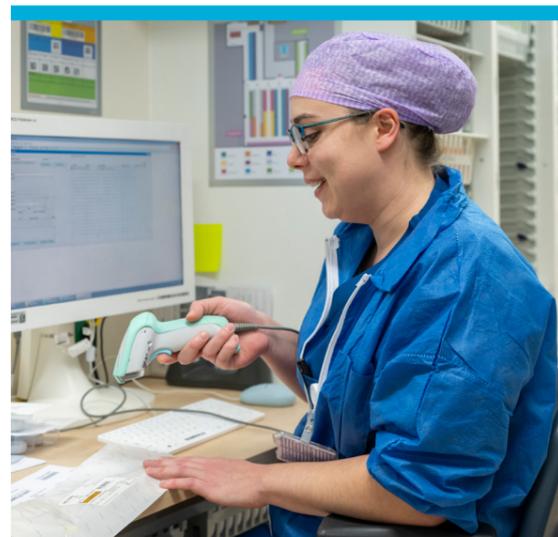
Storage and inventory control



Inventory management

Introduction

Similar to many hospitals, inventory management was a challenge for the NHS hospitals in Lancashire. Stock control was heavily reliant on manual processing with orders and supplies managed by a limited number of staff on a weekly basis. The NHS trusts decided to pool resources to form the Lancashire Procurement Cluster (LPC) in order to transform local procurement and supply chain services by centralising procurement and inventory processes. Since implementing GS1 standards and a new inventory management system (IMS), one of the hospitals in the cluster, East Lancashire Hospitals NHS Trust, has so far released 210 hours of clinical time back to care, reduced unwarranted clinical variation, and received a seven-fold return on investment following the implementation of the IMS.



Life before the inventory management system

Similar to many hospitals, inventory management was a challenge for East Lancashire Hospitals NHS Trust (East Lancashire) and Lancashire Teaching Hospitals NHS Foundation Trust (Lancashire Teaching). Stock control was heavily reliant on manual processing, and orders and supplies were managed by a limited number of staff.

Much of the inventory management responsibilities would fall to individual nurses to control stock levels for their respective wards or departments, taking them away from providing direct care at the patient bedside.

In theatres at East Lancashire for example, just 1.5 members of staff held responsibility for maintaining inventory levels. Product selection was often based on surgeon preference and orders placed "just in case" they might be needed. With 16,000 product lines to manage, the process was proving inefficient and unsustainable.

Plus, once the product had been delivered, the storage and inventory control was also impacted. Clinical staff would take products from main stores to create their own independent, localised stores. At one point there was in excess of 40 disparate locations spanning everywhere from ward cupboards to desk drawers.

To maximise efficiency, the three trusts opted to pool resources to centralise procurement processes. Lancashire Procurement Cluster (LPC) was then formed with one of its core aims being to standardise inventory management, and improve product visibility and operational efficiency across the trust sites.

Centralising inventory management

Lancashire Teaching and East Lancashire Hospitals had implemented an inventory management system (IMS), provided by GS1 UK partner Ingenica Solutions, as part of a Scan4Safety initiative.

Scan4Safety is based on implementing GS1 standards for the unique identification of every person, product, and place. Trusts involved in the initial programme demonstrated improvements to patient safety, the release of clinical staff time to care, and substantial inventory savings. With a GS1 standards-based IMS already in place, the LPC team opted to extend the roll-out of Ingenica to cover each of the LPC sites.

Ingenica's IMS holds GS1 Global Trade Item Numbers (GTINs) which allows products to be accurately identified, tracked, and traced across multiple locations. This would provide LPC with the transparency and visibility needed to improve stock control centrally.



Steps to getting started

- 1. Set up a project steering group**
Establish a group reflective of the stakeholders that will need to be engaged throughout the project. LPC's steering group included; a finance director, lead surgeons, estates and facilities professionals and IT representation. This was a critical step to help decide on the direction for implementation team to drive project success and buy in.
- 2. Market and stakeholder engagement**
Engage with internal stakeholders to better understand pain points and determine how the project could address the challenges.
- 3. System requirements**
Understand solution provider offering and identify system requirements and capabilities prior to implementation. With Ingenica's IMS already in place at one site, LPC had a tangible starting point to build from.
- 4. Define approach**
Determine the broad project scope and plan for rollout for example, a local or regional approach.
- 5. Resource planning**
Determine resource requirements for implementation. For example, operational staff may need higher engagement resource, particularly clinical staff in theatres where they are being asked to adopt a new task.
- 6. Phase one approach**
Agree locations for rollout as part of phase one planning. LPC targeted three theatres at the Blackburn site to begin implementation. The decision was taken to focus on the ear, nose and throat; and maxillofacial specialities as the team was already picking products for these areas. Buy-in had already been established to use as an example.

Tracing the end-to-end product journey

1. Each product has a fixed re-order point and re-order quantity set in the IMS. Stock levels are pre-approved based on the department's requirements.
2. Once levels fall below the re-order point, the system triggers an automatic order through the system provided by GS1 UK partner, Advanced. The order system integrates with NHS Supply Chain systems. Products are identified using the GTIN to ensure the right products are ordered.
3. Orders are placed against the balance sheet and attributed to the budget at the time of use when the GS1 barcode is scanned at the point of care. A cost code is then assigned and reconciled at the point it is issued to a patient at the end of the month to get accurate patient-level costings for procedures.
4. All implants and consumables are scanned to the patient via the Global Service Relation Number (GSRN) on the patient wristband. When the product is used, stock is replenished from the in-house main store-room based on consumption - a process known as 'closed stock loop'.
5. Products are receipted upon delivery, scanned into the IMS and allocated into LPC stores. This updates existing stock levels and cycle counts.
6. Products are picked for procedures a day or two in advance. It is transferred both physically and virtually to the theatre location - allocated against the GS1 Global Location Number (GLN). Stock levels in main stores and the theatre drops accordingly upon use.
7. A report is run at the end of each day in main stores which identifies threshold levels and triggers automatic stock order, all driven by patient-level consumption and point of care scanning to drive inventory accuracy.



8. Patient ID and the consumables used is updated in Ingenica for recall purposes. Data also resides in the central data warehouse. It links directly to the transvaginal mesh registry to support national reporting.
9. Every three months an optimisation report is generated to review usage levels to help inform stock level ordering decisions.

Implementation and benefits realisation at East Lancashire Hospitals

As one of the first hospitals under LPC's remit to fully implement the inventory management solution, East Lancashire Hospitals achieved numerous benefits to product traceability, stock control and crucially, patient safety. However, the implementation process did not come without its challenges.

Challenges

- 1. Incomplete product catalogues**
An accurate product catalogue is critical to the success of an IMS implementation project. East Lancashire uses the Nexus catalogue from GS1 UK partner, GHX. Product information in the catalogue is provided directly by suppliers so there is a single source of truth for product data. If any changes are made, the supplier updates the catalogue information which is then automatically made available to the trust. Any new products not identified in the catalogue are added into the catalogue by the trust's procurement team.

However upon starting the project not all of the trust's product lines were registered in the system. Staff had to add 1,600 unique lines manually to ensure that the relevant product data (such as GTIN, expiry date and batch number) was captured effectively.
- 2. Standardisation of quantities**
The team also had to define and understand each product's unit of measure provided by the supplier. Some suppliers referred to products in boxes of multiple units and others as individual units which initially caused quantity errors with ordering.
- 3. Unbarcoded products**
Limitations are also compounded by the fact that not all products have barcodes, preventing them from being scanned at the point of care. At present, 70 per cent of the trust's stored products have barcodes but the remainder have non-readable barcodes which cannot be scanned.

- 4. Clinical engagement**
The project's success was built on the foundation of clinical engagement as it relies on these teams to scan products. Failure to do so would result in inaccurate stock levels. The team focused on engaging clinical stakeholders to understand the benefits and tailor the "why" to meet their needs or objectives. This meant centring on highlighting mistakes and Never Events to showcase how Scan4Safety would make a difference to patient safety.

Accident and emergency use case

Hospitals in England are tasked with a maximum wait of four hours if a patient is admitted into accident and emergency (A&E). Amid nurse shortages, the trust's A&E departments became increasingly reliant on agency staff. However, valuable nursing time was found to be spent replenishing stock. This then prompted a review of materials management processes in an effort to release staff time to care.

Upon review, the East Lancashire team found that nurses were spending several hours managing stock control across five store rooms to maintain supplies for up to 40 trollies and 20 emergency grab bags. Clinical staff were spending time topping up each one at least once but up to as much as three times a day. Coupled with the standard weekly checks on product expiry dates the time spent on stock control worked out at more than 160 hours' worth of work.

With the automated inventory management process in place, a dedicated materials management staff member was allocated to remove the demand from the nursing staff. All product data is now captured and reported, including lot and serial numbers and expiry dates. The system then controls the data to prevent products from expiring before use.





Since taking this approach, A&E staff have reported an increase in nursing team morale and are beginning to see a reduction in agency spend.

Benefits realisation

Clinical time released to care

- 210 weeks of clinical time released to care in theatres due to less time spent on manual stock takes and admin heavy order processing over an initial implementation period of two years
- 168 hours a week of clinical time saved in A&E – the equivalent of four full time nurses

Financial

- £250,000 saved in theatres in just one month
- Reduced product wastage by 96 per cent in year one, equating to £83,000 saved
- Year two waste reduction by 62 per cent, equating to £53,000 saved
- £360,000 saved on stock reductions through accurate ordering and reduced product waste
- Based on savings made, investment in the IMS has resulted in a seven-fold return on investment within two years of implementation
- Accurate stock value costs achieved due

to improved product identification. Orders are made accurately and costed accordingly against the balance sheet. Balance sheet costs grew 75 per cent to £4.2m so the trusts are no longer underestimating spend.

Patient safety and product recalls

Items subject to a product recall alert can now be identified in seconds via the batch and lot number. In less than a minute, staff can establish where the item is, where it is located or where it has been moved to, how many are in circulation, and whether any have been implanted into patients. Patients can now be recalled promptly to reduce the risk of harm.

Product expiry dates are checked when scanned at the point of care to prevent expired products from being used for patients. Any products close to expiry are altered to be used first resulting in a reduced volume of waste.

Reduction in cancelled surgeries due to improved stock availability

Surgeon / clinical variation

Improved patient-level costings (PLICs) as products are scanned directly to the patient at the point of care or use. Costs are available to be relayed to consultants as part of regular cost reviews.

Increased awareness of cost variation for set surgical procedures as desired surgeon-specific products are tracked to the patient.

Decreased the number of surgeon-specific preference cards to 600, to begin standardising procedure costs.

Improved record keeping for traceability, allowing for greater oversight of patient outcomes. Products are linked to the patient record where outcomes can be monitored to either provide cause to justify or eliminate the surgeon preference card. For example, a procedure could cost £1000 more, but if the patient can be discharged the next day instead of next week, the cost balances out.

Conclusion and next steps:

At East Lancashire Hospitals, the team intends to continue the rollout of the IMS to cover all implantable medical devices and is exploring additional use cases such as pharmacy, blood tracking, surgical instrument tracking, and potentially staff uniforms. Project plans are also to explore interventional radiology, which will then be followed by endoscopy, bronchoscopy, and selected wards to help alleviate pressure on clinical teams.

In the community, the hope is to takeover stock control for 11 district nurse hubs in the East Lancashire region. This would allow the team to automate inventory processes for topping up treatment bags so the district nurses have the equipment they need at all times.

Across the Lancashire Procurement Cluster, the future approach focuses on three key areas. Firstly to complete rollout across the hospital trusts, secondly, to extend into the community and finally, to achieve a standardised approach across the region's integrated care system (ICS). Most of the hospitals in the trusts have fully adopted point-of-care scanning in theatres. LPC are working to introduce a similar model in Preston to align processes.

LPC's goal is to have all organisations within the ICS working with the same catalogue and IMS. With one stock profile across the region, the ICS will be able to better coordinate stock levels and benefit from a collective purchasing power, allowing any risk to be spread across multiple organisations. If one site runs out of a product, LPC will be able to determine which site locations have available supplies.

About the authors



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Simon Bennett, Logistics and Supply Chain Business Improvement Engineer, is an experienced NHS professional who has worked at all levels within the NHS supply chain functions at numerous NHS trusts in England. Simon has gained a wealth of internal NHS knowledge, as well as experience of inventory management implementation projects within the NHS, which he brings to the role.

About the organisation



The Lancashire Procurement Cluster (LPC) is a shared procurement and supply chain service for three large acute hospital trusts in the region (North east of England): Blackpool Teaching Hospitals NHS Foundation Trust, Lancashire Teaching Hospitals NHS Trust and East Lancashire Hospitals NHS Trust.

The service was created at pace in 2017 to address the challenges identified in the "Unwarranted Variations" report by Lord Patrick Carter, published in February 2016. In order to transform local procurement and supply chain services, the three NHS trust boards recognised the fact that no individual organisation had the scale to address the challenges in their entirety, and a new and innovative approach to procurement was required.

LPC has 125 staff, manages £320m non-pay spend and its partner organisations have a collective turnover of approximately £1.5bn. The LPC is committed to providing best practice procurement and logistics services to its members and customers in the health and social care sector.

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