




Spain

Towards a new management model: surgical prosthesis traceability

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| <p>Challenge</p> <p>The Hospital Universitari Vall d'Hebrón did not meet current regulations on traceability records for prostheses. Prosthesis storage and replacement orders were also resulting in logistics costs for the hospital.</p> <p>Approach</p> <p>With the goal of improving patient traceability, reducing errors and cutting the administrative workload for medical and nursing staff, Hospital Universitari Vall d'Hebrón decided to implement GS1 standards in surgical prosthesis management.</p> |  <p>Nursing staff are provided with an easy tool for registering prostheses</p> |  <p>Purchasing departments can order replacements from suppliers more quickly</p> |
| |  <p>More efficient management of invoicing for implanted prostheses</p> | <p>Implantation card can be printed with the necessary information for compliance with legislation</p> |



In a hospital, the most critical part of surgical prosthesis management is connecting it to the patient's history. With the goal of improving patient traceability, reducing errors and cutting the administrative workload for

medical and nursing staff, Hospital Universitari Vall d'Hebrón decided to implement GS1 standards in this area, specifically through GS1 barcode scanning.

As well as making it possible to establish traceability records for prostheses, in line with current regulations, this achieved other important goals such as:

- Providing nursing staff with an easy to use tool for registering patient-implantable materials in surgeries and clinics.
- Optimising the control and monitoring of prosthesis costs.
- Improving efficiency in the invoicing process.

Introduction

Hospital Universitari Vall d'Hebrón is the largest hospital complex in Catalonia and is part of the state-owned company, the Catalan Institute of Health, under the Catalan Ministry of Health. It's divided into three large medical areas: general care; maternity and childcare. They also cover traumatology and rehabilitation in a specialist hospital. In addition, surgical outpatient procedures are carried out in the Parc Sanitari Pere Virgili, which is located close to the hospital.

Hospital Universitari Vall d'Hebrón therefore covers practically all medical and surgical specialities

and boasts clinical support services, university teaching and research centres etc., to round off its medical and nursing activities. It has around 7,000 professionals working across 22 buildings, including 1,146 hospital beds, 182 of which are in intensive care, 45 surgeons, 381 consultation rooms and three emergency areas. Its budget for 2018 was 637 million euros.

The care provided is used as a benchmark in tertiary care and for highly complex procedures such as stroke, adult and child oncology, severe burns, multiple traumas, multiple sclerosis, and foetal surgery.

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The hospital carries out a yearly average of over 57,000 admittances, over 30,000 operations, over 870,000 outpatient-consultation visits, more than 200,000 emergencies, and over 10 million laboratory tests.

Its total prosthesis costs at the close of the 2017 and 2016 financial years came to 23.7 million euros and 20.3 million euros respectively, with 2017 seeing a 16.6% increase compared to the previous year.

Chart one shows that the specialist surgical area with the highest total prosthesis costs in 2017 was traumatology and orthopaedics, representing over 35%, followed by haemodynamics at 16.5%, arrhythmias at 12.9%, and heart surgery at 9.8%.

This was because the hospital has an area specialising in orthopaedic surgery and trauma and rehabilitation, although it was also influenced by the Catalan Ministry of Health's policy to reduce waiting list times for certain pathologies such as those requiring knee and hip implants.

| SERVICE DESCRIPTION | 2016 (€) | 2017 (€) | % variation |
|-------------------------------|-------------------|-------------------|--------------|
| TRAUMATOLOGY | 7,144,856 | 7,505,768 | 5.1% |
| HAEMODYNAMICS | 3,348,900 | 4,242,490 | 26.7% |
| ARRHYTHMIAS | 2,631,764 | 2,740,848 | 4.1% |
| HEART SURGERY | 1,987,966 | 2,222,958 | 11.8% |
| VASCULAR SURGERY | 1,236,799 | 1,428,917 | 15.5% |
| ANGIOGRAPHY | 745,041 | 1,506,181 | 102.2% |
| OPHTHALMOLOGY | 406,838 | 536,435 | 31.9% |
| MAXILLO-FACIAL SURGERY | 325,996 | 392,286 | 20.3% |
| BREAST PATHOLOGY UNIT | 206,279 | 149,787 | -27.4% |
| GENERAL SURGERY | 201,570 | 235,680 | 16.9% |
| OBSTETRICS AND GYNAECOLOGY | 160,717 | 115,860 | -27.9% |
| PAEDIATRIC HEART SURGERY | 144,756 | 256,576 | 77.2% |
| ENDOSCOPY | 134,027 | 117,596 | -12.3% |
| RECONSTRUCTIVE SURGERY/ BURNS | 304,136 | 385,282 | 26.7% |
| UROLOGY | 105,577 | 139,970 | 32.6% |
| PAEDIATRIC SURGERY | 43,003 | 151,722 | 252.8% |
| THORACIC SURGERY | 10,801 | 27,215 | 152.0% |
| OTHER SERVICES | 1,199,314 | 1,552,650 | 29.5% |
| TOTAL | 20,338,338 | 23,708,222 | 16.6% |

The challenge

The Catalan Institute of Health (ICS) launched a medium-term modernisation programme involving process re-engineering and standardisation of its information systems by introducing the SAP platform, first in the financial area and later in healthcare, for all its component entities.

A financial SAP was implemented in the Hospital Universitari Vall d'Hebrón in 2007 followed by a healthcare SAP there in 2010. From then on, and through the process re-engineering carried out in the various financial areas, every type of fungible material such as medical equipment, reagents and prostheses were basically purchased collectively for all the ICS hospitals, to exploit economies of scale, from the preparation of the corresponding public invitations to tender to their subsequent awarding and logistical distribution.

The logistics operator Logaritme, an entity partly owned by the ICS, provides logistical services for the storage and distribution of all types of supplies for the ICS's various hospitals and primary healthcare centres.

The reality of this model was analysed on the organisational and financial level, and its main conclusions were as follows:



1. The Hospital Universitari Vall d'Hebrón did not meet current regulations on traceability records for prostheses.
2. Prosthesis storage and replacement orders for suppliers were managed by the external logistics operator with the resulting logistics costs for the hospital.
3. It re-labelled the packaging of prostheses, making it difficult to return them to the supplier for any reason, such as expiry and loans.

Solution



The hospital sought to achieve three goals:

1. Tracing the prostheses by registering the serial number of each type of prosthesis used for each patient. In other words, “who has what”.
2. Implementing a prosthesis-storage registration and control system.
3. Reducing the logistics costs for the hospital.

The analysis conducted presented the opportunity to carry out a strategic change in prosthesis management, in all aspects, moving on from a centralised management model to a local management one.

To implement it, we redefined our purchase and logistics distribution processes. We integrated the information systems, the healthcare SAP and the financial SAP with external storage management systems. The hospital has a computerised management system for prosthesis composites used in traumatology surgery, and logistics cabinets for the other surgical specialities, located in traumatology and rehabilitation hospitals and in general, maternity and childcare hospitals respectively, for inpatient and outpatient surgery.

The change in model was reported internally and externally, with a timetable for implementation in the different surgical areas. The model was changed slowly and steadily, beginning with the services that were leaders not only in their healthcare work but also in opinion and management, with less resistance to change.

Externally, we gradually met with each of the prosthesis suppliers who won the tenders for the various surgical specialities to explain the change in the purchase and logistics model, and the replacement and delivery circuits.

They were asked to label all prostheses from then on with GS1 standards, specifically with the GS1 barcode. We also took the opportunity in those meetings to ask the various suppliers to work alongside the hospital to compile an inventory of all the prostheses in storage and to identify references without GS1 barcodes so that they could be relabelled or moved.

The day-to-day management of the healthcare storage systems, the use of the items in the surgery storage facilities to cover planned and emergency surgery, and the replacement of those items create uncertainties for the suppliers and the healthcare

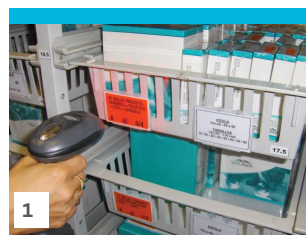
centres' supply departments as well, which is why establishing channels that regulate relations between suppliers and the hospital is not only advisable but necessary.

The tenders and awards of aggregate purchases by the Catalan Institute of Health and local purchases by the Hospital Universitari Vall d'Hebrón established which prostheses would be regularly used by all the surgical specialities.

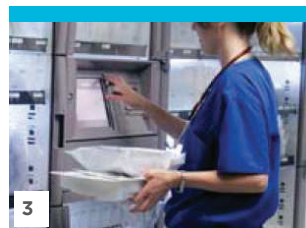
Based on this process, and to computerise the management of items in storage, as mentioned above, the Hospital Universitari Vall d'Hebrón has two systems: an external computerised system for the comprehensive management of surgical prosthesis composites for traumatology and orthopaedic surgery, and an automated dispensing logistics cabinets for the other surgical prostheses. These external registration and storage control systems provide information on replacements, withdrawals and returns, quantity, lot/series, location and retrieval.

In 2017, the hospital managed an average of over 7,600 different items in storage. Our automated dispensing cabinets hold over 1,200 items; the largest category is vascular, cardiac and thoracic surgery prostheses with 326 different items, followed by prostheses for haemodynamics and ophthalmology, with 271 and 268 different items, respectively.

For knee and hip prostheses, we have external computerised systems for composites, with a total of 1,250 different items. It is crucial in both cases for the industry to label their products with GS1 barcodes.



Examples of the use of composites for the external computerised storage-management systems



Examples of the use of automated dispensing cabinets for the external computerised storage-management systems

However, the Hospital Universitari Vall d'Hebrón has over twice as many different items in storage that are managed without any external system, stored in boxes together with the instruments required for implanting them. These include spinal implants, whose traceability we do not follow, and synthetic bone implants for use in traumatology and maxillo-facial surgery.

The pictures on the previous page show examples of the use of the external computerised storage-management systems, which may use composites (pictures 1 and 2) or automated dispensing cabinets (pictures 3 and 4).

The hospital now follows a system for registering prostheses in the healthcare SAP. During an operation for a specific patient, all prostheses that are implanted in that patient must be registered so that the material implanted, the supplier, reference, lot/series and expiry date are all known.

This solution does not depend on the route taken by the prosthesis, depending on whether it is in storage or in transit.

Registrations can be made through one of the three available options:

1. By accepting the proposal sent by the external computer systems' interface to the healthcare SAP. Prostheses are replaced in these systems through GS1 barcode readings.
2. If there is no proposal, for example, where the prosthesis in question is in transit, it will have to be registered in the healthcare SAP by reading the label with the GS1 barcode that appears on the box.
3. Finally, if neither of the above options is possible, the registration can be done manually, given that there are search functions which help in manual registrations by reference, supplier etc.



Conclusion

By using this model, Hospital Universitari Vall d'Hebrón have seen the following improvements:



1. Nursing staff are provided with an easy to use tool for registering prostheses for patients in surgery.
2. The information registered in the healthcare SAP lets us see the prosthesis' traceability.
3. The interconnection with the financial SAP allows purchasing departments to order replacements from suppliers more quickly.
4. The hospital's invoicing department can manage the invoicing for the implanted prostheses more efficiently according to the principles of the Department of Health, as well as the invoicing of third parties.
5. Thanks to prostheses being registered by patient in the healthcare SAP, the implantation card can be printed with the necessary information for compliance with current legislation.
6. As a consequence of the change in the prosthesis management model, increased spending on prostheses has not led to a proportional increase in the costs of the logistics operator.
7. Investing in models that combine technological solutions, space design and improvements in information systems promotes resource optimisation and efficiency.

The processes are currently being analysed to ensure that spinal prostheses can be traced, by using the healthcare SAP with reference and serial numbers. They're also looking at reducing the number of incidents relating to non-registration in the healthcare SAP, something that leads to increased workloads in all the areas involved.



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About the organisation



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