Application
Automatic medication storage and distribution

Installation
- 2 automated paternoster systems (Hänel Rotomat)

The pharmacy of the AZ Sint-Maarten (Campus Leopoldstraat) in Mechelen decided, in 2008, to buy, in addition to the 2 existing Rotomat systems at the Campus Zwartustersvest, 2 additional Rotomat systems for the automation of the picking process in this campus.

The pharmacy of the AZ Sint Maarten hospital is the result of an amalgamation of two hospitals, which, of course, results in larger quantities of medications and more medication pickings during a same period of time. The medications are distributed per department and per patient.

The Rotomat is a compact construction using optimally the available height under the ceiling, which results in a floor space reduction by about 60 %. The Rotomat operates according to the proven paternoster system, meaning that the products come to the user and not the reverse way. Hence a time reduction.

In combination with the Pharmalogic.Extended software, a very high productivity with fewer people can be reached (more people available for other tasks). This software makes it possible to store medications in an optimal way, and takes also into account the expiry dates and the product lot numbers.

Procedure
There is a bi-directional interface with the Infohos pharmacy software.
Infohos sends the various electronic distribution lists to Pharmlogic.Extended. The medications are picked by patient or by department.
The Rotomats are operated optimally to pick the greatest possible quantity of products with the fewest possible motions.
The workopening is equipped with LEDs showing the exact location of the requested medication.
The information concerning the picking action (description, department or patient name, quantity, etc.) is indicated on the Rotomat display. The quantity is confirmed or corrected by means of the keyboard of the Rotomat. This confirmation or modification is sent immediately back to Infohos.
Computerized paternoster systems (Rotomat)
- automation of the distribution
- space saving
- time saving
- higher productivity
- optimal storage
- maximum number of pickings
- exact location management

Pharmalogic. Extended software enables optimum storage of the medications taking the expiration date, and the lot numbers of the products into consideration.
INTENSIVE CARE NURSING DEPARTMENTS ZNA - JAN PALFIJN HOSPITAL MERKSEM - BELGIUM

In this hospital a great difference was noticed between the quantity of ‘supplied products’ and the quantity of ‘invoiced products’ because many given products were not registered. They wanted to limit the financial loss by improving the registration and by invoicing more quickly.

Therefore a controlled storage and distribution system was installed by Vanas medical for anaesthetics and medications at the ‘Intensive care’ department.

- The ‘dispenser’ is a compact and modular system for the storage and distribution of anaesthetics and medications.
- The E-lock drawer cabinets are used for the storage and the distribution of medications, perfusion solutions and also for voluminous medical products.

Application

Controlled medication distribution at the “intensive care” department.

Installation

- 1 Dispenser - Pharmalogic.Dispenser
- 4 E-Lock cabinets
- 1 refrigerator with electronic locking

Procedure

Each interaction between the user and the system occurs by means of a touch screen. The user logs in with his name followed by a fingerprint checking.

After patient and prescribing doctor selection, the medication list appears on the display. After selection of the medication and of the required quantity, the corresponding drawer opens (in the dispenser or in the E-lock cabinet).

In the dispenser, the drawer opens in such a way that only the required quantity can be taken.

In the E-lock drawer cabinet, the whole drawer opens. As soon as the drawer is closed again, the consumption is transmitted automatically to the pharmacy software package for invoicing. This means huge administrative simplification!

In the pharmacy, the prescriptions are printed ‘a posteriori’ for signature by the concerned doctor.

Changing to the computer controlled systems was done without problem for the users and the intended results were achieved sooner than expected:

Before this installation, only 50% of the supplied quantity was invoiced. The comparison with the results for the same period one year later, showed an improvement up to 90%.
The user logs on using his name and password, fingerprint, badge, ...

Selection of the patient, the medication and the required quantity

Selection can also be done through barcode scanning

The corresponding drawer is unlocked.
A LED light indicates the drawer on the dispenser or the E-Lock cabinet

At the Dispenser, the drawer opens only to the extent that only the requested quantity can be taken

At the E-lock drawer cabinet, the drawer is completely unlocked giving access to all products stored in this drawer.

Before this installation, only 50% of the supplied quantity was invoiced. The comparison with the results for the same period one year later, showed an improvement up to 90%.
ZNAl STUIVENBERG HOSPITAL ANTWERP - BELGIUM

Installation

- Dispenser controlled by Pharmalogic Dispenser
- E-lock cabinets and refrigerator with lock have been installed in each of the following departments:
  - Intensive (I.T.U.)
  - Hemato-oncology
  - Sterile room
  - Nursing unit – burn injury centre

The main reasons why a computerized medication cabinet has been bought were:

- Losses of medications
- Not invoiced medications
- Better control of anaesthetics

The replenishment of the cabinet is done completely by the pharmacy. The stock in the various departments is now considerably lower than before, nothing is lost and the stock is replenished every time a product is picked. The stock and the expiry dates are correctly followed up. The administrative work in the pharmacy is reduced.

The dispenser is used here mainly for anaesthetics. The E-lock cabinets contain special products, such as perfusions, catheters, bandages and cannulas.

“The stock in the various departments is now considerably lower than before.”
Installation

The emergency department and chest pain unit (c.p.u.) and also the operating suite and recovery room are equipped with:

- Dispenser, controlled by Pharmalogic Dispenser
- E-lock cabinet and refrigerator with locking device

Each department determines itself the contents of the automated medication cabinets, but, in fact, all the medications (department stock) are stored in the cabinets, except the blood transfusion products.

The medication cabinets are very user-friendly and offer advantages for the user as well as for the pharmacy:

- Many medication boxes are very similar. Mistakes are now practically excluded and the safety improved.
- Better management and permanent stock checking of the decentralized pharmacy
- Communication with the HIS (hospital information system)
- Perfect control of the consumptions and so no loss of data for invoicing.

Better security because errors are almost completely excluded.
In 2007, after a test period of one year, it was decided to install dispenser – E-lock – refrigerator combinations in 18 nursing departments in addition to the already existing installations in the emergency and recovery room, operating suite and CPU. In this way, each nursing department was given its own medication ‘picking’ stock in a 80/20 proportion: 80 % of the necessary medication stock is at the department itself and 20 % in the central pharmacy.

Linking Pharmalogic Dispenser to the electronic prescription of Qcare has been the key of the success of this installation. The stocks as well as the medications for personal use are stored in this equipment. The nurses choose themselves when they prepare the medications and the pharmacy can also organize replenishment in a more flexible way. Fewer products are returned to the pharmacy and the not administered medications are checked first and then put again into the Vanas cabinet and credited to the patient. From that moment on, they are available again and can be taken for other patients. Same for the administrative work: no prescription, dispatch note, double check anymore! In addition, in case of failure or stock shortage, if any, it is possible to check, within the cabinet network, in which installation(s) the failing product(s) is (are) available.

Procedure

The doctor prescribes medications electronically in Q-care. The electronic prescription goes to the pharmacy for validation, to the planning sheet for the nursing department and to the Vanas cabinet. The (head) nurse decides by herself when she can prepare the medications for the next 24 hours. She selects the concerned patient on the Vanas cabinet and commands the cabinet to release the prescribed medications. Those are put into the medication trolleys and brought with the next round(s).

Replenishment from the pharmacy occurs quickly and efficiently, purely based on the consumptions; the patient data are treated automatically.
The Jan Yperman hospital decided in 2008 to automate the distribution of medications. 18 nursing and medico-technical departments were equipped with the dispenser – compartment control – E-lock and refrigerator combination. This project was realised completely in about one year.

The simplification of the medication distribution and registration in the departments was, among others, the objective to be attained.

In order to attain this objective, an interface construction was installed between the Cegeka, Infohos and Vanasoft packages.

The advantages were obvious

On the one hand, the nursing personnel gains time thanks to the use of the electronic prescription Cegeka package combined with the distribution capabilities of the pharmacy and the Vanas cabinets.

On the other hand, the pharmacist can organize the distribution in a quicker and more flexible way and can consult the consumptions permanently on line.

In addition, the problem of the returned medications has been reduced very strongly.

The system offers the additional advantage that the users can consult permanently on line the available stocks in other (nursing) departments and call them, if necessary, for their own patients; which can be interesting when the pharmacy is closed or when the searched product is no longer in stock in the own department.

The registration and distribution of medications in the departments are simplified and can be followed up better.
The AZ Jessa hospital in Hasselt is the first Belgian hospital having a NIAZ accreditation and one of the objectives of the management is patient safety. During the latest years, the government has encouraged all kinds of initiatives contributing to patient safety. The use of automated systems to store and keep medications is part of the governmental projects.

In order to improve the safety of the medications, Vanas cabinets have been installed in many departments, among which the emergency department and the medical and chirurgical intensive care department. Those cabinets contain medications covering 90% of the needs.

Doctor’s prescriptions, pickings by the nursing personnel, registration and invoicing are automated. The calculations show that, after 2 years, the investment is completely paid off with, in addition to a great safety improvement for the patients.

Beside the positive financial aspect and the increased medication safety, there is also a gain in time in the pharmacy thanks to a great reduction of the quantity of returned products. As a consequence, the installation of additional Vanas cabinets has been included in the budgets for the coming years.
AZ SINT JAN
BRUSSELS - BELGIUM

Installations
Dispenser and E-lock as an emergency cabinet
Dispenser and 6 E-lock cabinets + refrigerator locking system in the resuscitation department, controlled by Pharmalogic.Dispenser.

Objectives
For the pharmacists:
• Increased safety for the patients through checking of the prescribed medications.
• Full traceability of the medication
• Reduction of the financial losses due to forgotten invoicing
• Registration time reduction

For the nursing personnel:
• Time gain and reduction of mistakes in copying the prescriptions that have to be treated by the central pharmacy
• Increased safety of the medications due to a better checking by the pharmacy, joint manager of the cabinets and dispensers

Experience
The implementation did not occur without difficulties, which is inherent in that kind of projects. After a relatively short adaptation period, all the users are convinced now of the advantages of the cabinets and dispensers. Most objectives have been achieved: reduction of the administrative work, reduction of mistakes due to wrong interpretation of prescriptions or when preparing the prescriptions. In the future, there will be an additional advantage by the use of the electronic prescription.

Working method
Each morning, the nursing personnel takes from the cabinets all the medications prescribed for a determined patient. The medications are then brought to the patient’s bed in a controlled way. The medications that have not been given are put back into the cabinets 24 hours later and stored in a drawer, which has been especially foreseen for them.

“Most objectives have been achieved: Reduction of the administrative work, reduction of mistakes due to wrong interpretation of prescriptions or when preparing the prescriptions.”
SÖDRA ÄLVSBORG SJUKHUS
APOTEKET
BORAS - SWEDEN

The first hospital in Scandinavia with computer controlled medicine stores!

Södra Älvsborgs Sjukhus in Borås is the first hospital in the Nordic countries to start using computer controlled medicine stores. In close cooperation with Apoteket AB, this means for the hospital a considerable improvement of the management of the medicines from the pharmacy to the patient.

As a start, two computer controlled medicine stores were installed in the hospital. The first system is installed in the emergency department and the other one is a common store for several wards.

The system in the emergency department contains appr. 170 product numbers, while the common store contains appr. 400 product numbers.

A more professional supplier

With those installations Apoteket AB has become a considerably more professional supplier and can now offer new services which are appreciated by the customers.

Health Tech as a project partner

Health Tech was selected by Apoteket AB as the supplier and partner for the installation of the first automatic medicine stores in the Nordic countries. Apoteket, the hospital and Health Tech have worked in close cooperation to the implementation of the project. They adapted the systems to the specific needs and wishes of the users.

Improved patient safety

The systems in Borås give the hospital a basis for improved patient safety thanks to the strongly reduced risk of picking the wrong medicine. The system registers permanently all the products picked in the stores. This is considered by the hospital as being the most important feature of the system.

Improved efficiency and improved management

With the new medicine stores, Södra Älvsborgs Sjukhus has improved the efficiency of the daily work of the nurses.

All tasks like counting, ordering, reception and stock replenishment have been transferred to Apoteket AB. The stores contain medicines as well as liquid products. The automation of the ordering processes lays the basis for the optimisation of the stocks and replenishments.

The risk of taking a wrong medication is greatly reduced.

<table>
<thead>
<tr>
<th></th>
<th>Goal</th>
<th>Result after 6 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medication related problems</td>
<td>Reduction 30 %</td>
<td>Reduction 50 %</td>
</tr>
<tr>
<td>Medication handling time</td>
<td>Reduction 30 %</td>
<td>Reduction 29 %</td>
</tr>
<tr>
<td>Number of products in stock</td>
<td>Reduction 50 % (from 1500)</td>
<td>Reduction 42 %</td>
</tr>
<tr>
<td>Turnover (stock)</td>
<td>Increased 400 % (total wards and pharmacy)</td>
<td>Increased 63 % (wards only) Goal revised.</td>
</tr>
<tr>
<td>Waste and expired products</td>
<td>Reduction 50 %</td>
<td>Reduction 100 % (*)</td>
</tr>
</tbody>
</table>

(*) Now, the pharmacy is responsible for the management of the medicines stored at the wards. The hospital pays only for the products that have been consumed.
ØYA HELSEHUS
TRONDHEIM
NORWAY

Medicine cabinets in Øya Helsehus

Øya Helsehus, is located next to the St.Olav Hospital in Trondheim. It is a new and long-term concept in the Health Care sector in Norway. The patients are transferred from St. Olav Hospital to Øya Helsehus via a glass covered bridge. They normally stay at Øya for three weeks before they are transferred back to their residence or to a nursing home. Øya Helsehus is fully digitalised, and computer controlled medicine cabinets of Health Tech were chosen for the medication logistics. Øya Helsehus opened for the first patients in August 2008.

The following results have been achieved:

- Reduced consumption of medicines due to less waste and optimized stock and purchasing
- Improved quality and reduced risk of wrong medication
- More time for the patients due to removal of administrative tasks linked to medication logistics (the cabinets order medicines automatically, and the personnel of the pharmacy replenishes the cabinets)
- A more efficient working day for the nurses due to automatic anaesthetic accounts and other reports.
- The medicine prescriptions of Gerica are made available for the nurses when they pick medicines.

A total concept

At Øya Helsehus there are 140 beds in three wards at three floors. The wards at the 4th floor and the 6th floor have medicine cabinets containing the basis assortment of medicines, while the medicine cabinet at the 5th floor has in addition to the basis assortment an assortment of less required medicines for use at all the three ward.

Integrations to TietoEnator (Gerica) and in the pharmacy software

The installations of Health Tech are integrated in the pharmacy software for the automatic sending of orders from the cabinets to the pharmacy. Health Tech and TietoEnator have, in close cooperation with Øya Helsehus, developed an integration between Pharmalogic and Gerica (a TietoEnator software.) Prescriptions typed in Gerica will be automatically available at the medicine cabinet for the picking of medicines for a patient. This improves the efficiency and the quality of the prescription and of the picking of medicines.

“Reduced consumption of medicines due to less waste and optimized stock and purchasing.”
Picking of medicines in a hospital requires from the personnel involved a lot of work and a great concentration. Ergonomy is therefore very important. The Lista Uno work tables meet this need as they have easily adjustable heights, which means that they can be adjusted to the wish of each individual worker. The rear panel of the work table is equipped with straight en/or inclined shelves, in which small packages with medicines can be stored, within reach, in a convenient and compact way. Another advantage of those work tables is their industrial quality, which guarantees their durability.

Easy picking, compact storage
Vanas medical has realised already several projects with Lista Uno work tables for the picking of medicines. The work tables are mostly equipped with slanting shelves with stop, on which larger packages can be stored. The shelves on the rear panels of the tables are filled with bulk products. Here, they chose in many cases the drawer cabinet systems of Lista, which makes it possible to store a large quantity of small packages with different references in a very compact way.

As an option, some of the shelves can be equipped with roll-down shutters to protect hazardous products.

Storage on the drawer shelves is generally as compact as on the mobile shelf systems. The advantage of the drawer system, however, is that several people can access the shelves at the same time, which makes the work more flexible and leads again to a higher productivity. For each project, the best possible arrangement is discussed together with the users in order to reduce the walking distances to the minimum. The Swiss manufacturer Lista offers in addition a wide range of partition material so that the shelves can be made to suit the specific storage needs. For the rear part of the work tables, there are also many arrangement possibilities. Thanks to the modular concept, the installation can be enlarged or modified later on to suit the new needs of the users.

Efficient picking in hospitals
For the picking of personal medicines per patient, vanas medical supplied the Centre Hospitalier Régional in Huy with work tables with multifunctional rear panel of Lista. This is an ergonomic and durable solution, resulting also in higher productivity.

CENTRE HOSPITALIER REGIONAL - CHR HUY - BELGIUM

For the picking of personal medicines per patient, vanas medical supplied the Centre Hospitalier Régional in Huy with work tables with multifunctional rear panel of Lista. This is an ergonomic and durable solution, resulting also in higher productivity.
The Centre Hospitalier Régional in Huy intends, more than ever, to make of their biological lab an important instrument for the diagnosis and the follow up of the medical evolution of patients, and is thereto investing in the newest technologies. The lab treats 400 patient files on a daily basis, analysing about 1500 blood samples. After the analysis, the samples are stored in the lab, where they need to remain available during 20 days. This means that the lab has a permanent stock of 30,000 blood samples.

Until recently, this storage was done in several refrigerators:

- A large part of the (expensive) lab floor surface was used for non-productive storage.
- Retracing a sample took a lot of time.
- The temperature in the refrigerator rose each time the refrigerator door was opened.

To improve this situation and furthermore to meet the standards for an ISO-certification, Mr Wanet, manager of the lab, chose to install a Hänel Rotomat with sliding doors and an integrated cooling installation. All 30,000 samples are now stored on a total surface of 4 m², at a constant temperature of 4.8°C. Each of the 20 levels in the Rotomat contains the samples of 1 day. After 20 days, the oldest samples are destroyed and replaced by the samples of the following day.

The software developed by Vanasoft for this application, guarantees an optimal traceability:

- Access through a user code in combination with a fingerprint identification: only a qualified personnel has access to the data and the samples.
- All the samples can be registered and retraced by scanning the barcode containing the patient data.
- The exact position of the requested sample is indicated by a light bar, so no time is lost.
- All the motions are logged, from the moment the sample is stored for the first time until the moment it is destroyed.
- All the logged data can be printed out or exported to xls-format.

The compact storage and the gain of time create physical and budgetary space for additional equipment: a fine contribution to the search for higher quality.