

Safe medication and patient safety are key concerns at Antonius Hospital

The traceability of medication in the pharmaceutical sector all the way from production to use by patients is important to ensure safety. That is why increasing use is being made of barcoding at the lowest level. This paper deals with the views of Antonius Hospital (which has establishments in Sneek, in the Dutch province of Friesland, and Emmeloord in the Noordoostpolder, Flevoland) on the registration of the administration of medication.

Michiel Duyvendak is a hospital pharmacist working at [Antonius Hospital](#) Sneek/Emmeloord, with responsibility for Pharmaceutical Care in the hospital and nursing homes, Logistics, Medication Safety and the Electronic Medication Record (EMR). He is also an active member of the Dutch Association of Hospital Pharmacists (NVZA). "We began the project 'Registration of the administration of medication by means of barcodes' in August 2011. The aim was to prevent registration errors as far as possible. Safe medication and hence patient safety are our key concerns."

Convincing the Board of the importance of the switch to digital

The Antonius Hospital went paperless in 2011. "This was a great opportunity for implementation of our project 'Registration and verification of the administration medication by means of barcodes', said Michiel Duyvendak. Our motto was, "Just do it; don't wait till all problems have been ironed out."

Did Duyvendak manage to persuade the Board to back the project? "Yes, it's useful to share the vision as widely as possible. It also helps to reach agreement with such officials as the Information Manager and the Security Officer. In addition, the support of the Board made it possible to cut costs. The staffing costs were covered by the existing personnel budget. Bedside computers were already listed in the digital dossier. We did have to request a budget for the barcode scanners, while the wireless network was included in the project budget."

Barcoding at the lowest level

The hospital's barcode-based administration registration system went live at the end of December 2011. Michiel Duyvendak: "Each item of medication, at the lowest level of registration, already has or is assigned a barcode [see next section – *Ed.*] Consider a pill, for example. When it is issued by the pharmacy, it is scanned and sent to the appropriate ward. Then the barcode on the patient's wristband is scanned just before the medication is administered. The display on the computer screen then confirms that the right product is being administered at the right time to the right patient. Finally, the medication issued by the pharmacy is scanned once more and registered in the system."

Article management is a challenge

Article management proved to be one of the main challenges in this project. Michiel Duyvendak explained the problems involved: "Which articles are barcoded, and which are not? Which barcodes work, and which are ineffective? We checked all 2600 articles that we use, and designed a barcode label based on the GS1 standard for the articles that were found not to have one. Of course, it would be best if the manufacturers provided all products with a barcode based on this standard. Unfortunately, the industry has not yet reached this stage."

Another challenge is that some products do have a barcode, but the supplier changes the code without informing us. The result is that the medication in question will no longer be recognized. To deal with this problem, we keep a log of the registration scans and give products one of our own codes when they are not recognized. Logging also makes it possible to print out reports that show when the system is or is not working, and whether it is in use."

Legislation and optimal safety of medication

The Dutch healthcare sector has opted to use the [GS1 DataMatrix](#) for unique identification of articles. It is also possible to include further product information in this symbol. The NVZA aims to introduce the use of the GS1 DataMatrix for all medication used in hospitals, down to the lowest level, to make the administration of medication as safe as possible. Duyvendak: "Also EMR suppliers have to support the use of the GS1 barcodes in the different steps of the process from pharmacy to patient."

"European legislation supports the use of the GS1 DataMatrix. But unfortunately not on a single unit level", Duyvendak continues. The European Parliament and the Council of Ministers recently decided that all

medication must comply with the [Falsified Medicine Directive](#) with effect from 9 February 2019. This directive aims to ensure that patients are never supplied with fake medicines that pass themselves off as real, authorized products. Manufacturers can comply with this directive by providing each package containing a given product with a unique serial number. The GS1 DataMatrix can also be used for this purpose. However, a barcode at single unit package – the lowest level – is needed to ensure safe medication when an administration registration system is used.

Viabale system

The barcode-based administration registration system used at the Antonius Hospital has made the administration of medicine safer and hence improved patient safety, says Michiel Duyvendak. "Medication is much more traceable and verifiable now, but there is still room for improvement. The hospital staff sometimes "forget" to scan the medication. The likelihood of this happening depends on the user-friendliness of the software, among other things. For example, a pop-up appears on screen when medication has to be scanned. This is very useful, since the nurse who has to administer the medicine cannot avoid seeing it. In the original version of the system, the nurse had to click on the pop-up to get rid of it. This involved putting the scanner down and using the mouse to remove the pop-up before continuing the procedure, which was inconvenient. The system has now been modified so that the pop-up disappears when a specific barcode is scanned. This is much more user-friendly, and motivates nurses to use the system."

In the final analysis, the success of the system depends on how easy it is to work with at the patient's bedside, Michiel Duyvendak continued. "Apart from the user-friendliness of the software, the reliability of the Wi-Fi network is also crucial. Nurses can hardly be expected to work with a system that is constantly breaking down."

Michiel Duyvendak concluded by saying, "Don't forget, the whole project depends on careful consideration of the psychology and behaviour of the users. It is our task to design a system that our people will want to work with, and to explain to them as carefully as possible why it is important to scan the medicine you are administering."

Tips:

If you are thinking of introducing barcoding for the administration of medication, you may find Michiel Duyvendak's tips useful:

- 1) Just do it!
- 2) Involve the nurses who are present at the patient's bedside.
- 3) Pay adequate attention to the user-friendliness and compatibility of the automated system.