

# When the nursing staff become bar code fans

## ABSTRACT

Heidelberg University Hospital records its materials by scanning them: a fitness programme for DRG billing, the ordering system and budget management.



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## About Heidelberg University Hospital

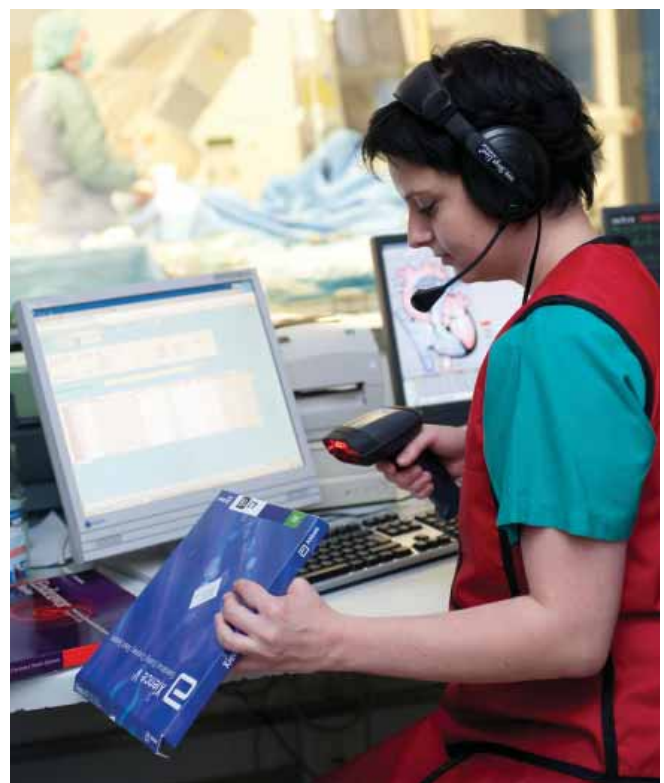
Heidelberg University Hospital with its more than 40 specialised clinical departments is one of the leading medical centers in Europe.

7,300 employees, including 1,200 professors and doctors, treat hundreds of thousands of patients every year from all over Germany and many other countries, coming here to make use of our modern treatment facilities.

*Scanning at Heidelberg University Hospital  
(Source: Heidelberg University Hospital)*

## The impact of Diagnosis Related Groups (DRGs) billing

"How much material do we consume for each individual patient or, in technical terms, for each individual case?" An important question for the controlling department of Heidelberg University Hospital and the other German hospitals. Since the introduction of the Diagnosis Related Groups (DRGs), health insurance companies are billed on a patient-related basis, so it is important to carefully track the individual materials consumed at the hospital. Transparency is also important in the hospital for planning and controlling internal processes. The overview of which ward consumes what volume of materials facilitates the processes for procurement and inventory control, as well as those for budget management and planning.



## Introducing bar coding to ensure transparency

Before scanning was introduced, implants were recorded accurately, but the nursing staff only kept rough records of screws, nails, catheters, covers, and other material, on paper. Precise billing for a patient was consequently only possible with a great deal of effort, and was in some cases impossible. The hospital therefore, had no transparency for some costs. For repeat orders patient labels were attached to internal order forms. The forms were forwarded to purchasing, which initiated the order and posted it to the case number, to the patient. This system is not only complex, but quickly reaches its limits, for example whenever a package contains a larger number of products than, say, in the case of syringes and catheters. As a rule these products are not labelled individually. The employee then affixes the label from the box onto the order form, but has not used up all the contents of the box for the patient. Furthermore, often several materials are used per patient and measure. This can sometimes involve over 50 different products, for instance during an operation.

The controlling department of Heidelberg University Hospital found the remedy by scanning the delivery bar codes on the packaging for the various materials.

This enables the material required for the patient to be recorded as soon as it is used. At the start of the project the University Hospital entered the material master data, including the unique GTIN (Global Trade Item Number), in the database of the merchandise management system. The hospital works with SAP software here. Both the merchandise management system and the hospital information system are SAP modules. The staff records all the activities for each patient in worklists. The medical products used for each measure can also be recorded. To do this, the employee goes from the measure concerned in the worklist to a material list. When they scan the bar code, the product is automatically included in the material list, the system taking the data which is linked to the GTIN encrypted in the bar code from a database. The material has now been entered in the list and the next material can be scanned. Scanning, recording, scanning the next product, and so on. This automatic recording of the products fulfils one major condition: the nursing staff has a user-friendly system at its disposal.

*Label with GS1-128 bar code (Source: GS1)*



## The system learns from mistakes

The Heidelberg University Hospital goes one step further when scanning. It checks the success of each individual material recording operation. Has all the material data been entered correctly? Are there problems with the supplier information? Is the GTIN, which is unique worldwide, contained in the material master data? Is the bar code clearly legible? What are the staff on site doing while scanning? Thanks to a sophisticated error management system the controlling staff can answer all these questions. The system automatically stores every scan operation centrally. Using this database the Controlling staff can evaluate the success of the scan project, with the result that the number of faulty scan operations is reduced.

In addition, nothing in the documentation is lost because if no product information from the database is available when a bar code is scanned, the team can research this information and enter it retroactively.

Currently 600 scan operations take place each day in the hospital in various wards, for example Vascular Surgery, Endoscopy and Urology. In the medium term the number is scheduled to rise to approx 5,000 per day.

## Need for (standardised) bar codes

Another important requirement for Heidelberg University Hospital for a solution for precise patient-related billing concerns the product labelling. Around 90 per cent of the materials used in the hospital have a bar code, and 75 per cent of these are unique. At least three out of four products can thus be recorded unambiguously using the bar code. Most products have a GS1 bar code. The others either have none or only an internal bar code which permits no unique assignment. With these products an employee must assign the correct information to each product. Despite a high level of automation, this often requires painstaking care.

But from the experience of the users, Heidelberg University Hospital knows that scanning is fast and efficient only when the bar code is located in the correct place, the packaging contains no more than one bar code, and ideally the product is labelled or even has a bar code directly on its individual packaging. In this it is of the same opinion as other hospitals. Here they must rely on the suppliers. It is in their hands to decide which bar codes are affixed to the packaging and how.

For this reason, a number of hospitals have already expressed their wishes for product labelling to their suppliers, for example at joint road show meetings in 2010. Here the EK-UNICO and the hospital purchasing syndicates which are organised in the German Association of Purchasing Institutions in the Healthcare Sector (BVBG) spoke in favour of medical products being identified unambiguously by means of GTIN at various packaging levels.



Drugs package with GS1 DataMatrix (Source: Bluhm Systeme)

In addition, the packages should, as far as possible, only have one clearly legible GS1 bar code, and the master data for the products should be transferred electronically using GS1 standards.

In addition to the classical GS1 code, GS1 offers two further bar codes which are tailored to the special features of the Healthcare sector: the GS1-128 bar code and the 2D code GS1 DataMatrix.

Users can encrypt master and movement data in the GS1-128 bar code. The GS1-128 symbols offer a high level of security and delimit the data contents presented there from non-standardized bar code applications.

The GS1 DataMatrix can encrypt a large amount of information in a very small space. The GTIN (Global Trade Item Number), for example, can be accommodated on print areas of less than 25 square millimeters and consequently label very small products. Because of its technical configuration the GS1 DataMatrix is suitable for direct labelling of components or, for instance, surgical instruments. The authentication of the products at the various levels of the supply chain permits unambiguous traceability. Product counterfeiting can thus be reduced and callbacks can be organised more efficiently and more effectively.

The standards are developed by practitioners from pharmaceutical and medical devices companies and hospitals in regular exchanges of ideas at an international level.

## Beyond DRG

There are a wide range of applications for the GS1 Standards in hospitals. In addition to the recording of material usage for more efficient DRG calculation chosen by Heidelberg University Hospital, they can be employed, for example, to record patients more easily and to manage their care more effectively. Further information supplied in the bar code, such as the batch number or serial number and the expiry date, can be used to guarantee automatic control of the expiry dates. Storage of the batch number or serial number is helpful for patient documentation, for permitting the batch to be tracked and for possible callbacks. The data identifier system of the GS1-128 bar code and of the GS1 DataMatrix permits information such as the batch number and expiry date to be read out unambiguously.

What is useful for the hospitals should not be detrimental to the suppliers. They, too, profit from the labelling of their products with standardised bar codes.

## Little effort, great benefit

In the case of Heidelberg University Hospital the effort and costs for setting up automatic material recording were kept within limits. In addition to the existing IT solutions, the hospital invested in new camera scanners and one or two computers. The scanners are USB-capable and are compatible with every computer. The data processing is designed in such a way that the processes can be freely selected by the users. This means that users can decide whether they scan the material immediately at the time it is used or later. Every area – be it, for example, the care sector or the OP area – can decide according to its needs.

Sceptical at the beginning, the staff on the wards are now thrilled by the speed and the potential of scanning. Even though it initially entails more effort because all the material used for a patient is recorded in this way, they are now fascinated by the additional options. The new transparency makes transactions such as orders and budget management easier for the nursing staff. The hospital management profits from the precise overview of the materials consumed not only in the billing of the health insurance companies, in budget control and procurement management: it also has more leeway in negotiations with the health insurance companies.

Other hospitals, too, have already looked into bar code scanning and tested it in practice. GS1 bar codes applied by the supplier achieved time savings of up to 86 per cent for patient-related consumption recording at the Heart Centre Bad Krozingen. In a project in the logistics and document centre at the St.-Marien-Hospital in Bonn, for instance, scanning the materials enabled a total saving of 472 working hours when extrapolated over the year.

Although the Heidelberg University Hospital cannot yet put any figure on the money and time it has saved by scanning, it feels the benefits every day in the procedures. And that despite a quarter of the materials not yet being adequately labelled. One further important aim is therefore to work with the suppliers to achieve optimum product labelling.

## ABOUT THE AUTHOR

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Tobias Schneider is Deputy Head of the Managerial Accounting Department of the Heidelberg University Hospital. He also lectures on cost management and managerial accounting for Healthcare as assistant professor at several colleges of higher education. Tobias Schneider holds advanced degrees in Business Administration from the Universities of Tübingen, Bozeman (USA) and Mannheim, and is specialised in managerial accounting, public & non-profit management and production management.