



# Barriers to the use of barcode systems in the medication process

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## Background:

The medication process is a critical process known to be associated with a high risk of errors. Barcode systems are intended to reduce errors that occur during the medication process if used appropriately. In 2011 barcode systems were first introduced in the medication process in public hospitals in the Capital Region of Denmark

## Aim:

- To investigate to which extend barcode systems were used during drug dispensing.
- To identify barriers to the use of barcode systems in the medication process at two hospitals in the Capital Region of Denmark.

## Methods and materials:

Data were collected by questionnaire survey, observation and a subsequent interview. All data were conducted during April and May 2012 at two hospitals in the Capital Region of Denmark. At both hospitals drug dispensing was done manually by nurses. All drugs were dispensed directly from the original package. Barcode systems to be used in the medication process were implemented at both hospitals. Nurses (n=27) from four wards were observed during drug dispensing and administration and subsequently interviewed. A total of 100 nurses from 25 wards were invited to respond to a questionnaire survey.

## Conclusion:

The present results show that on average 48-53% of all drugs were scanned during drug dispensing.

Several different barriers to the use of barcode scanning were identified. The results from the present study emphasize the importance of ongoing focus on implementation, development and quality assurance of barcode systems in order to obtain the full benefits of such systems in relation to reducing errors and improving patient safety in the medication process.

## Results:

A questionnaire response rate of 87% was obtained. A total of 476 drugs were observed during dispensing.

On average 48-53% of all drugs were scanned during dispensing (observation and questionnaire).

The percentage of drugs scanned depends on the type/formulation of drugs, thus tablets and capsules were on averaged scanned in 63% of the observed cases whereas oral inhalations (patient specific drugs) were scanned in 0% of the observed cases (see Figure 1).

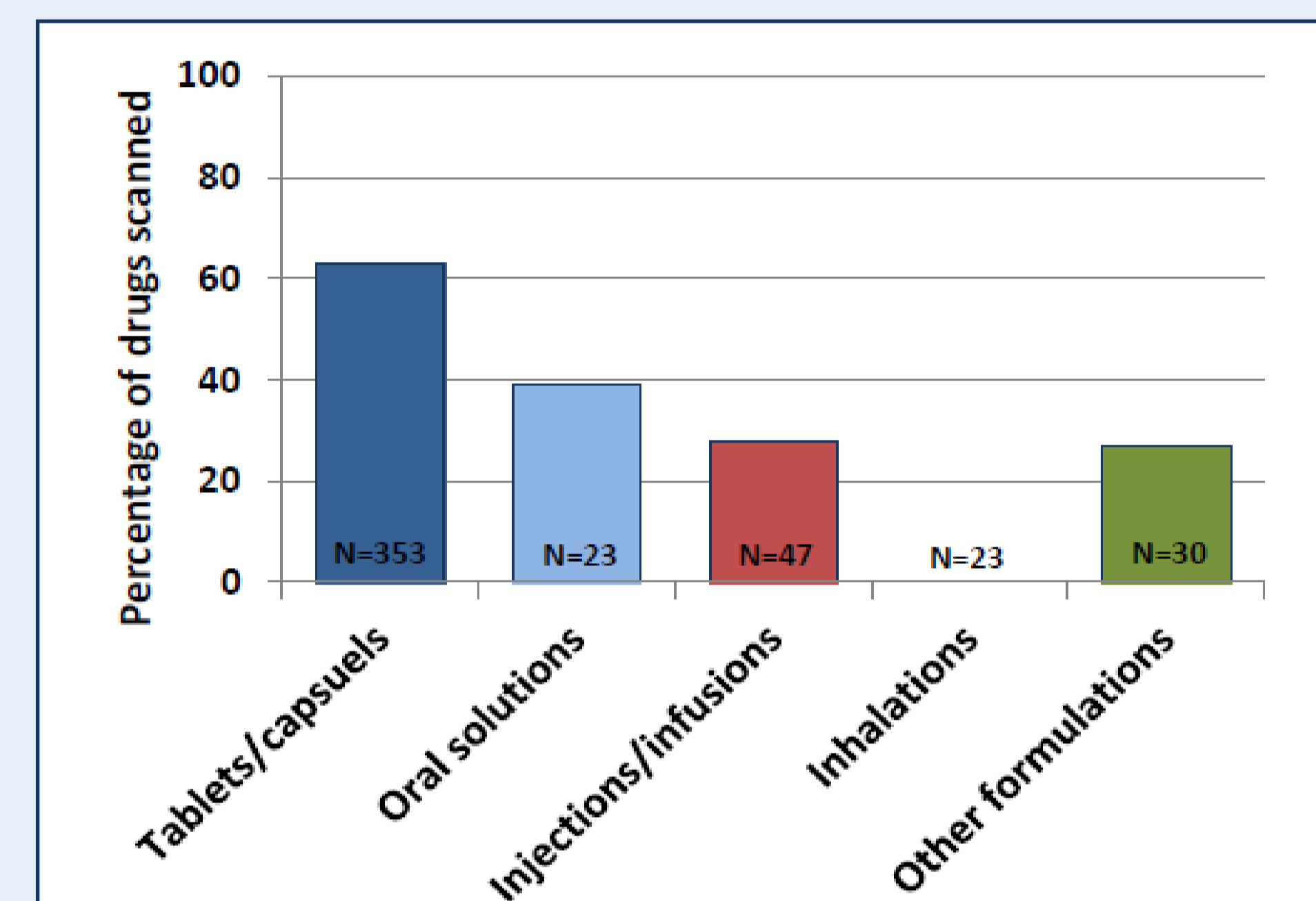


Figure 1. The percentage of drugs scanned during drug dispensing. A total of 476 drugs were observed and of these 224 were not scanned. Other formulations include plasters, suppositories, eye drops etc. N: total numbers of observations (scanned and not scanned) in each category.

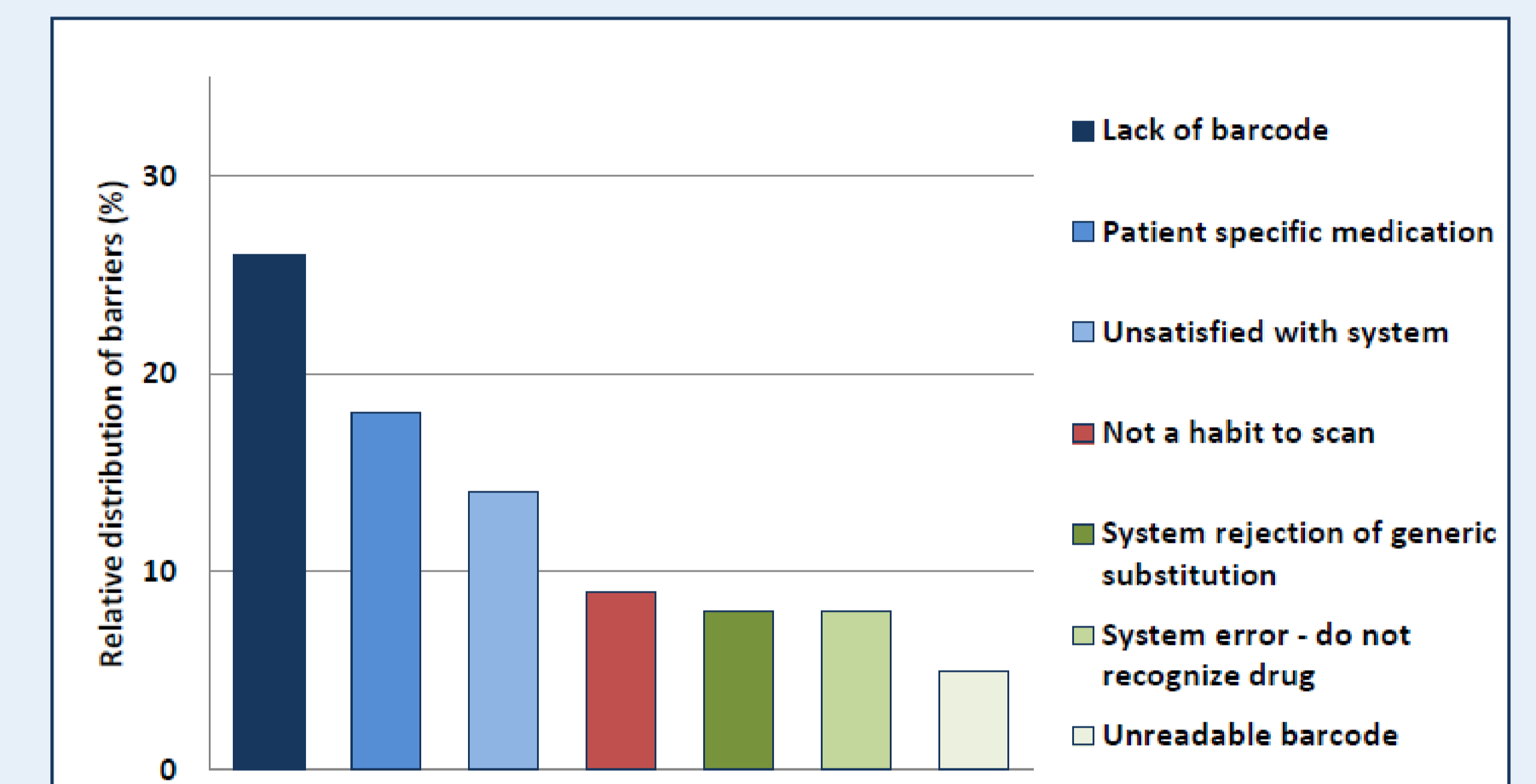


Figure 2. Relative distribution of main barriers identified by observation. Relative distribution (%) is calculated as the number of times a barrier was observed relative to total number of drugs that were not scanned (N=224).

| Barrier                                                | Interview (N=26) | Survey (N= 87) |
|--------------------------------------------------------|------------------|----------------|
| Additional system registration of generic substitution | 9                | 3,3 ± 1,3      |
| Many system pop-up boxes with warnings/questions       | 2                | 3,6 ± 1,2      |
| System rejection of dose substitution                  | -                | 3,6 ± 1,0      |
| Vehicles for i.v. drugs can not be scanned             | 1                | 4,1 ± 1,0      |
| Acute situations                                       | 3                | 3,8 ± 1,2      |
| Stress/pressure of work                                | 2                | -              |
| Nurse sure about the drug to be dispensed              | 2                | -              |
| Doctor have not accepted prescription electronically   | -                | 3,4 ± 1,1      |

Table 1. Additional barriers identified by interview and survey. Interview: Presents number of interview where the barrier was mentioned. Survey: Presents the average score on a 1-5 scale.

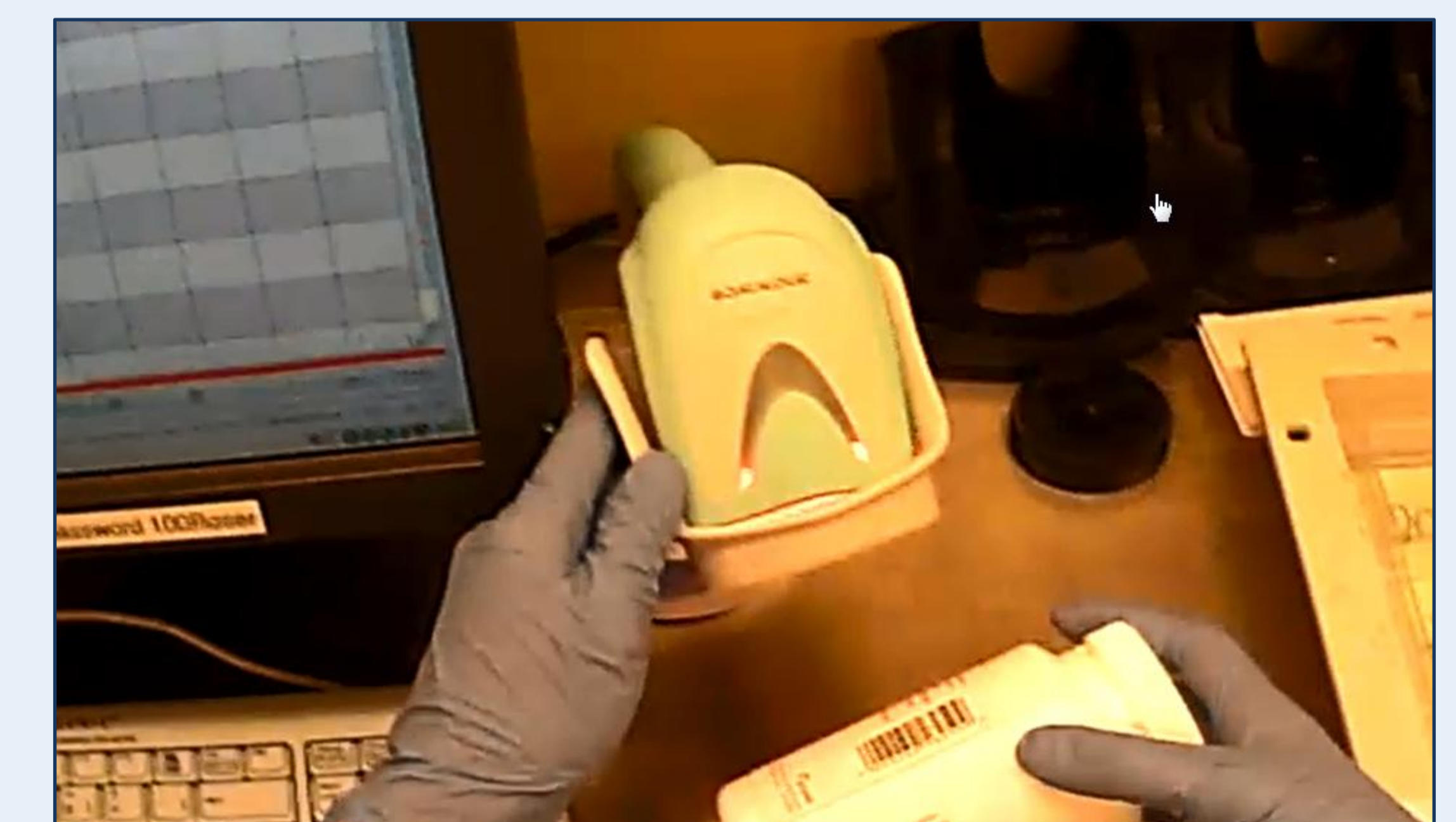


Figure 3. Barcode scanning of drug during dispensing.



Scan me !!