

# Designing drug packages to support correct barcode scanning and closed loop medication

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## BACKGROUND AND IMPORTANCE

St Olav's hospital, a large university hospital in Norway, introduced electronic prescribing and closed loop medication for more than 700 beds in November 2022. Oral medications are predominantly available as unit doses, other medications as barcode labeled packages. After introducing closed loop medication with barcode scanning during preparations and bedside administrations, data showed that barcode scanning was not performed or failed for a large part of medicines.

## AIM AND OBJECTIVE

A team of pharmacists, nurses and IT personnel have analyzed technical and practical barriers to why medications are not scanned or recognized by a barcode scanner during preparation in the ward medicine room or bedside during administration.

## MATERIALS AND METHODS

Data was collected for administrations and preparations where verification by barcode scanning had failed or not been performed in the period November 2022 – February 2023. The electronic prescribing system provided data that showed if an administration was performed by scanning or not, and what data was read by the barcode scanner during a scan. All data read by a barcode scanner was analyzed. In addition, the nursing staff was consulted to provide more information of the problems with the physical packages during preparation or administration. Products that did not have a printed barcode at all were not included in the analysis

## RESULTS

Six different areas were identified as potential barriers for implementing barcode scanning in closed loop medication during preparation and administration:

### System does not recognize the medicine when scanning barcode:

#### 1. Barcode printed on package but product code /GTIN in the national drug registry is missing

Result from scanning:

✗ Barcode not recognised in system

Expected result if product code available from drug registry:

✓ Barcode recognised and medicine identified in system



#### 2. Barcode printed on package but with wrong implementation of ISO/GS1 encoding

Result from scanning:

`]d2(01)07060644110753(17)060825(10)2220AA3ND`

Expected result if ISO/

GS1 was implemented correct:

`010706064411075317060825102220AA3ND`



### Barcode not easily available for scanning/when needed:

#### 3. Barcode printed on package but hidden behind text or tear-off label

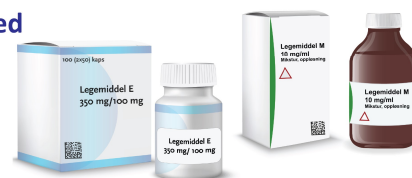
#### 4. Contrast for the barcode scanning was not good enough



#### 5. QR codes with links to training materials or other barcodes confused the nurse and the wrong code was scanned



#### 6. Barcode only printed on the outer package that was removed when stored in the medicine room



## CONCLUSION AND RELEVANCE

The identified barriers have been presented to drug manufacturers and competent authorities in Norway to raise awareness of how drug package design and correct/incorrect use of barcode printing affect implementation of closed loop medication.

The findings in this study, together with work done by EFPIA-EAHP on single unit coding for the hospital sector, will also be used in the development of a national best practice guide for barcode labeling of medicines. The development of the national best practice guide is led by Farmalogg, the National drug registry for Norwegian pharmacies.

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