

# MEDICATION ERRORS REGARDING HIGH-RISK MEDICATIONS IN A HOSPITAL'S ELECTRONIC INCIDENT REPORTING SYSTEM

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## Background

High-risk medications increase the risk of causing harm to patients and include anticoagulants, digoxin, gentamicin, insulin, potassium, opioids, and low-dose methotrexate.

In our hospital, a Barcode Medication Administration (BCMA) system has been implemented to enhance patient safety by reducing the risk of medication errors.

The BCMA system involves the following key steps:

- Patients receive scannable wristbands with unique barcodes.
- Medication packaging contains unique barcodes.
- Finally, both the patient's wristband and the medication are scanned to verify administration accuracy.

These steps within the BCMA system ensure adherence to the 5R's (Fig. 1) in medication management.

## Objectives

- To analyse and quantify medication errors in an electronic reporting system handling adverse events in a hospital with BCMA.
- To conduct semi-structured interviews with nurses to explore their perceptions of BCMA and high-risk medications.
- To quantify scannable high-risk medications packages.

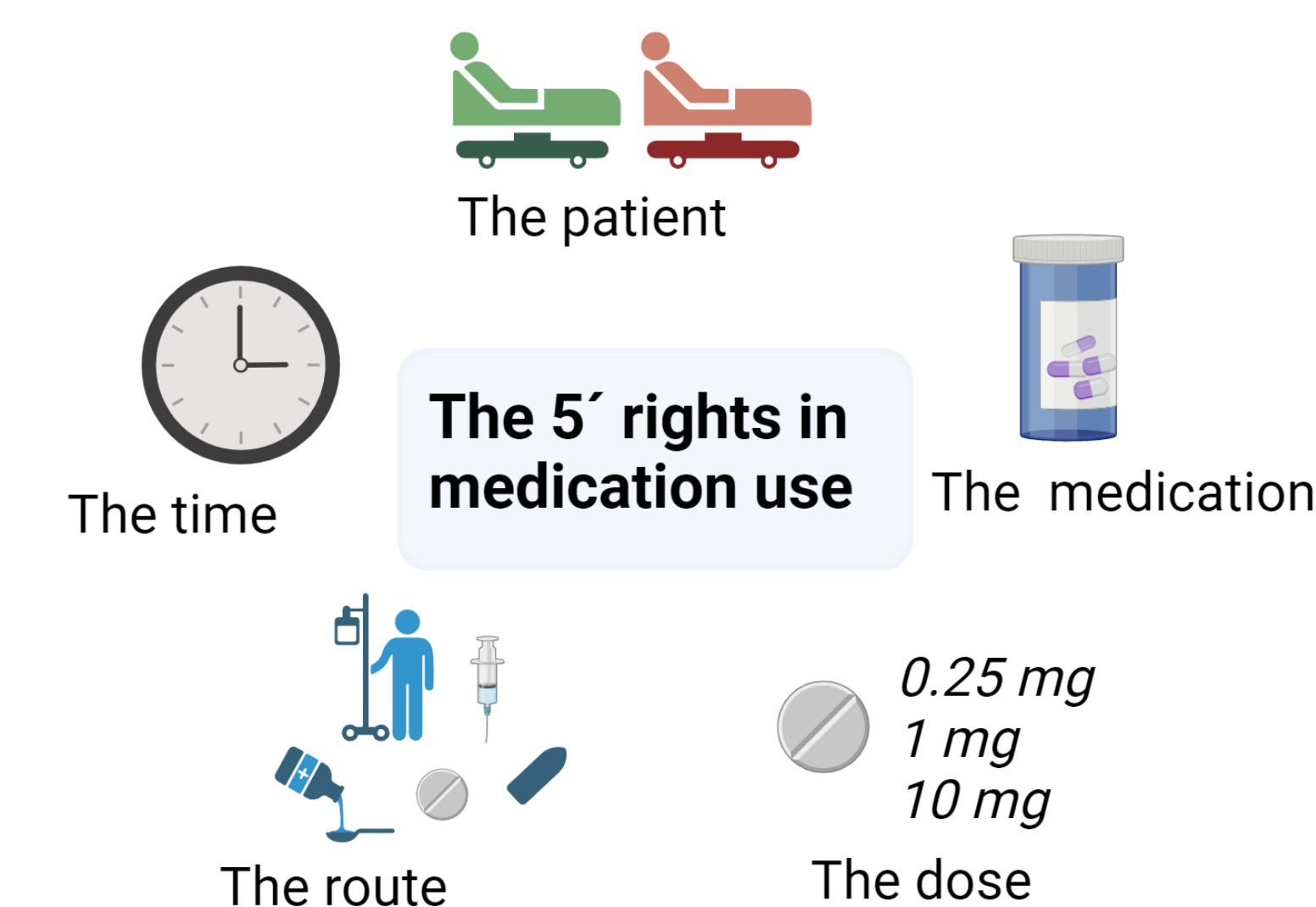


Figure 1.

## Conclusions

We uncovered three main areas, which should be focused on to improve the 5R's in medication handling;

- The electronic reporting system handling adverse events and its functionality ought to be improved. Most likely the reported errors are only the tip of an iceberg. A template on how and what to include in the reports should be constructed and be easily accessible for health care personnel.

- Training programs and/or learning notes on high-risk medications and other risk areas in medication handling should be performed continuously.

- Assigning a barcode to all medications at unit dose level is needed to increase compliance to the BCMA system.

## Results

Health care professionals reported 1777 medication errors and nearly 30% (n=467) were associated with high-risk medications (Fig.2). Most errors involving high-risk medications occurred during prescribing (28%) and drug administration (40%). Anticoagulants and opioids were most frequently reported. There were 293 different high-risk medication packages at the hospital and of them 14% lacked barcode at medicine unit level, most of which were anticoagulants and opioids. The semi-structured interviews identified three main themes regarding BCMA and high-risk medication handling (Fig.3)

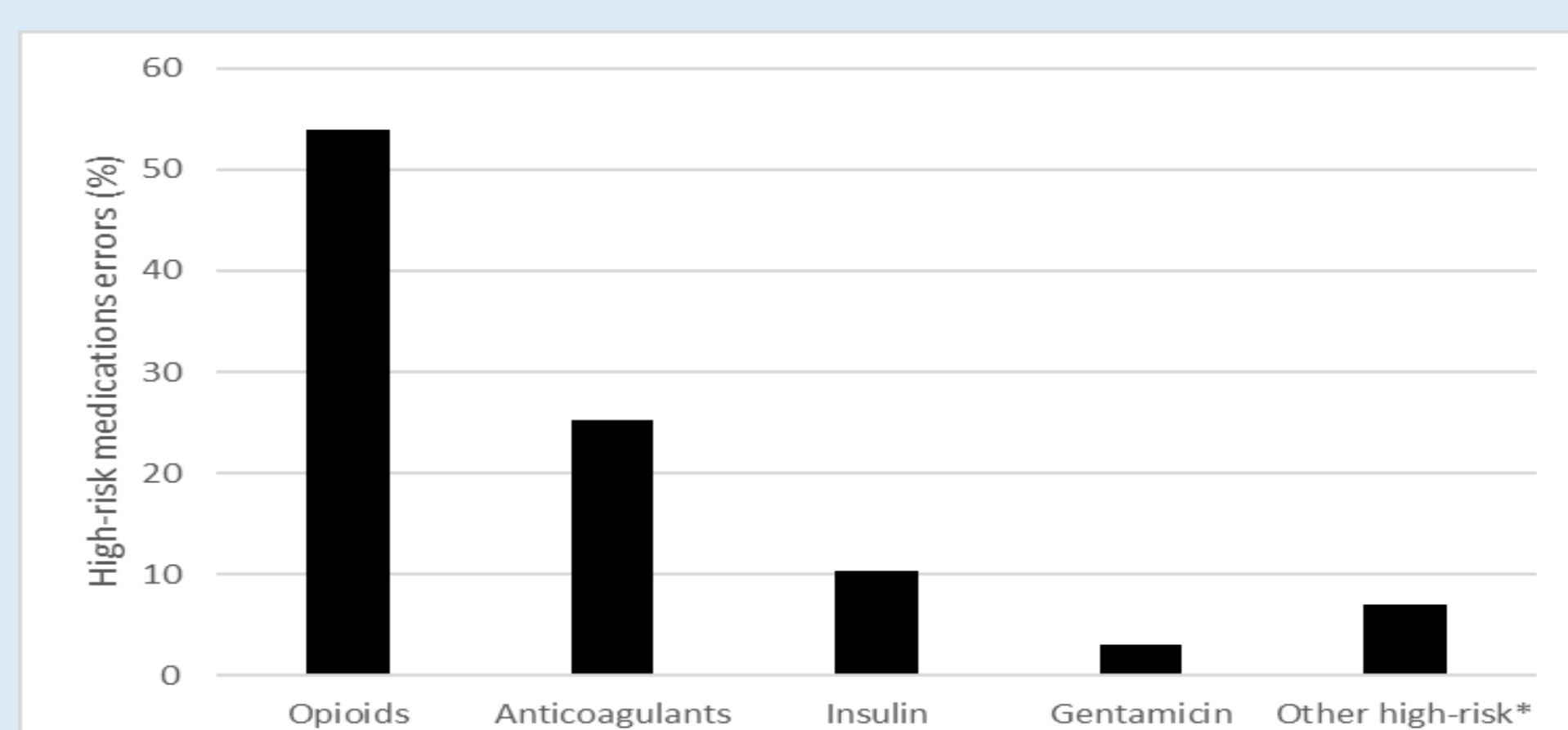


Figure 2; Distribution of high-risk medication errors. High-risk medication errors reported to the hospital's electronic incident system during a 36-month period.

\*Potassium, digoxin, low-dose methotrexate.



- | Procedures and routines  | Work conditions   | High-risk medications   |
|--|---|---|
| <ul style="list-style-type: none"> <li>• Disrupted workflow</li> <li>• Workarounds</li> <li>• Lack of documentation</li> </ul> | <ul style="list-style-type: none"> <li>• Understaffed</li> <li>• Lack of time</li> <li>• Unreliable technology</li> </ul> | <ul style="list-style-type: none"> <li>• Lack of barcode</li> <li>• Lack of knowledge</li> <li>• Patient's own medications</li> </ul> |

Figure 3; The main findings from the semi-structured interviews with the nurses.

## Main findings and implications

Enhancements in electronic reporting systems, continuous education about high-risk medications, and unit dose-level barcoding are essential for improving medication handling and the 5R's. These are essential variables for enhancing patient safety and minimising medication errors.

## Methods

- Quantitative: All medication errors reported to the hospital's electronic system handling adverse events, during a period of 36 months (01.01.2018-31.12.2020) were systematically reviewed.
- Qualitative: A semi-structured focus group interview was conducted with nurses from medical departments, with focus on the implementation of BCMA and use of high-risk medications.

