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Standardization of Medication Trolley to Ensure Medication Safety of Inward Patients: A Case Study from the Base Hospital Udugama

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Abstract

Medical Error is defined as deviations from the identified process of care, which may or may not cause harm to the patient. Medical errors denote a serious public health problem and exert a threat to patient safety. Main causal factors of medical administration errors are medication name confusion and improper container labeling. As such, project has aimed to develop a standard medication trolley for the hospital to prevent drug and medication administration errors, thereby ensuring patient safety

Key words: Medical Error, Medical Trolley, Ministry of Health, Sri Lanka

1. Introduction

Base Hospital, Udugama is a type A Base Hospital in the Southern Province, which provides healthcare to the public who mostly attend from rural, agricultural & estate areas. The bed strength of the hospital is 150 with average bed occupancy rate of 85%. The hospital provides curative and preventive services including specialized accident and emergency, medical, surgical, obstetrics and gynecology, pediatrics, psychiatric, radiology, dental, laboratory, and intensive care services. Base Hospital – Udugama is a fast-developing healthcare institution with the aim of providing high quality and safe care services on demand of its clients with minimum number of staff including nursing officers.

Medical error is defined as deviations from the process of care, which may or may not cause harm to the patient (1). Medical errors denote a serious public health problem and exert a threat to patient safety (2). A study suggested that medical errors represent the 3rd leading cause of death in USA (3) account for ∼98,000 deaths per year (4). The most common medical errors are identified as Medication errors (including adverse drug events/reactions), Healthcare-associated infections (HAIs), Surgical errors, Laboratory errors, Patient Falls and Pressure sores (4). Medication errors are the most common type of medical errors that occur in hospitals. and in USA medication error is the eighth leading cause of death higher than car accidents, breast cancer, and AIDS (5,6). Medication errors are described as any Patient Safety Incidents (PSI) where there has been an error in the process of prescribing, preparing, dispensing, and administering, monitoring or providing advice on medicines (7). Unsafe medication practices are the leading causes of avoidable patient harm in health care systems across the world and it costs 40 billion dollars annually (8). Studies found that most common medication errors occur in the administration stage (9). In a review of 91 direct observational studies of medication errors in hospitals, estimated that medication administration errors in hospital to be around 8%-25% among them (10). It has been proven that the largest proportion of medication errors during medication administration and nurses play a significant role in the occurrence as well as prevention of medication administration errors (11). Studies have identified the main causes of drug administration errors are due to poor lighting, inadequate staffing patterns, poorly designed medical devices, handwritten orders, ambiguous drug labels and lack of an effective independent double-check system (12). One of the main causes of deaths due to medication error was identified as wrong medication administration due to drugs name confusion, similar or misleading container labeling (13, 14). According to the Institute of Medicine (IOM) report, equated poor labeling as a central cause for medication errors (15).

Base Hospital Udugama has lesser number of nursing staff compared to its workload. Hence, it is difficult to allocate designated nursing officers for each ward; as a result, most of the nursing officers have to work in different wards according to the demand of patient care. In addition, most of the nursing officers are relatively junior, further adding to the possibility of errors. This has been confirmed by the medication errors reported to the quality management unit of the Base Hospital Udugama during the administration of oral drugs by the newly recruited nursing officers. Ergo, Quality management unit decided to introduce a standard medication trolley to each ward in order to prevent such errors.

The general objective of the intervention was to develop a standard medication trolley for the hospital to prevent drug administration errors with ensuring patient safety. The specific objectives were to identify issues in current inward drug administration practices related to medication trolley those affected to patient safety; to identify innovative suggestions from the staff to create a new medication trolley; to design a new standard medication trolley for implementation of the project; and to establish monitoring and evaluation system to ensure sustainability of the project.

2. Objective

The objective of the project was to develop a standard medication trolley for the hospital to prevent drug and medication administration errors, thereby ensuring patient safety.

3. Methodology

Hospital administration called a meeting with Quality Management Unit (QMU) to discuss reported medication errors and near misses during the year 2020. During the meeting, novel suggestions to develop a standard medication trolley to eliminate reported adverse issues during last year to the QMU were discussed. Further, members agreed to give common institutional number and permanent color code to each medication container considering alphabetical order of the medication name. Arrangements were taken to give definite place for each container following alphabetical order. It was further noted that expiry dates of each drug need to be labeled clearly in each drug container on regular refilling basis. Drug allergy band was introduced to prevent risk of administering allergic drugs. A prototype medication trolley which included all agreed suggestions and responsibility was given to the QMU for conduct awareness sessions with demonstrations to all nursing staff of the hospital. Finally planned to do audit and progress review after six months period of implementation.

In order to achieve the above objectives, following activities were implemented.

3.1 Identification of issues in current inward drug administration practices related to medication trolley those affected to patient safety.

Focus group discussion was conducted with ward/unit in-charge nursing officers and the quality liaison officers to collect their inputs. The main issues were identified as unavailability of proper system for labeling of drugs, difficulty in the identification of expiry dates, poor arrangement of the drugs containers in the trolley, as well as the lack of uniform arrangement of the drugs in different wards as well as a double-checking system to identify a drug. It was time consuming and risk to nursing officers who work in different wards.

3.2 Soliciting of innovative suggestions from the staff to create a new medication trolley

Innovative ideas were solicited from the staff to address the aforementioned challenges, as well as to improve the current practices in the wards. Some innovative suggestions such as allocating an institutional number and color code to each drug according to the alphabetic order, to arrange the drug container on the trolley according to alphabetic order and displaying of the expiry dates of each drug need clearly on each drug container were received. Further, it was suggested to give different color code system for dangerous drugs. In addition, it was also suggested to apply allergy wrist band to patients with drug allergy.

3.3 Design a new standard medication trolley and implementation of the project

The first medication trolley was designed according to the finalized criteria of the focus group discussion by the quality management unit. The quality management unit were given responsibility to prepare and distribute drug labels for all wards/units according to the finalized criteria of standard medication trolley. Nursing officers of each ward were given training on the preparation of the new medication trolley with highlighting its importance in improving patient safety. Then each ward/unit prepared their medication trolley according to the standard medication trolley. Based on the above suggestions, each ward/unit in the hospital was invited to introduce a standard medication trolley. The same numbering system was followed by the dispensers and the pharmacist working in the indoor and outpatient dispensary.

3.4 Establishment of a monitoring and evaluation system to ensure sustainability of the project

A nursing officer from each ward was assigned the responsible to maintain the medication trolley and the drugs cupboard according to the updated standards and guidance. In addition, the responsibility was given to in-charge Nursing Officer of the Quality Management Unit and the unit/ward Nursing Sister to observe the drug trolley while doing ward round. System was strengthened to report adverse events and near misses to quality management unit. The progress was discussed at the monthly quality management review meeting. Most of the nursing officers expressed a positive response to the new system during such discussions since it was safer and efficient.

4. Results

Post introduction of the standard medication trolley, all hospital wards adhered to adequate prior awareness. At present, Nursing Officers able to identify one medication by five different identities as by name, number, color code and position of the container and strength. With this new common practice, allocation of nursing officers for scarce resourced units from another unit is practiced hassle free. The initial progress review done by the QMU was evidenced as effectively absorbed to minimize medication administration errors.

As a result of the intervention, each ward/unit of Base Hospital Udugama now has a standard medication trolley with the numbering and color code. Considerable adherence by nursing officers to the new system was observed by the supervisory officers during daily ward rounds and monthly quality management review meetings.

5. Conclusion

Hospital was able to successfully implement the standardized medication trolley with the collective effort of all units and currently it is contributing a lot to prevent wastages of expiry medication in wards, saving nursing time, enhancing medication safety and saving cost of healthcare. Sustainability of this project can be ensured with regular audits and supervision.

6. Discussion

As a fast-developing healthcare institution in both infrastructure and service delivery, there is need to improve patient safety aspects in parallel as well at Base Hospital Udugama. Minimizing of medication errors is an important step towards that. Introduction of a standard medication trolley was a simple yet innovative, efficient and cost-effective interventions to reduce medication errors, and to improve patient safety at Base Hospital Udugama.

Each ward has same standard medication trolley with similar color code. As such, Nursing officers are now able to work in any ward/unit easily while minimizing the medication errors due to the uniformity of the drug drolly as per the standards. In addition, they can easily identify a drug by number, color code and position of the container easily. The new system is noted to be both time saving and reduces the risk of issuing wrong drugs to patients. Further, it helps to identify the expiry date of the drugs easily reducing the chances of issuing of expired drugs. Easy identification of the dangerous drugs also has contributed to the improvement of patient safety. The introduction of the allergy band was also contributing to easily identify patients with allergies to food, medicines or plaster.

Overall, the project positively contributed towards ensuring the medication safety during drug administration to inward patients and the reduction of the cost associated with adverse events.

7. Recommendations

It is recommended to introduce a standardized drug trolley system to each hospital in the county to reduce drugs administration errors to enhance medication safety. Based on the lessons learnt from this case study, the Directorate of Quality and Safety of the Ministry of Health could take the leadership in this regard.

Figure 1: Standardized drug trolley at ICU and Ward 7

Designated position of the drug containers in the drug trolley

Figure 2: Five independent double-checking systems for the identification of each drug
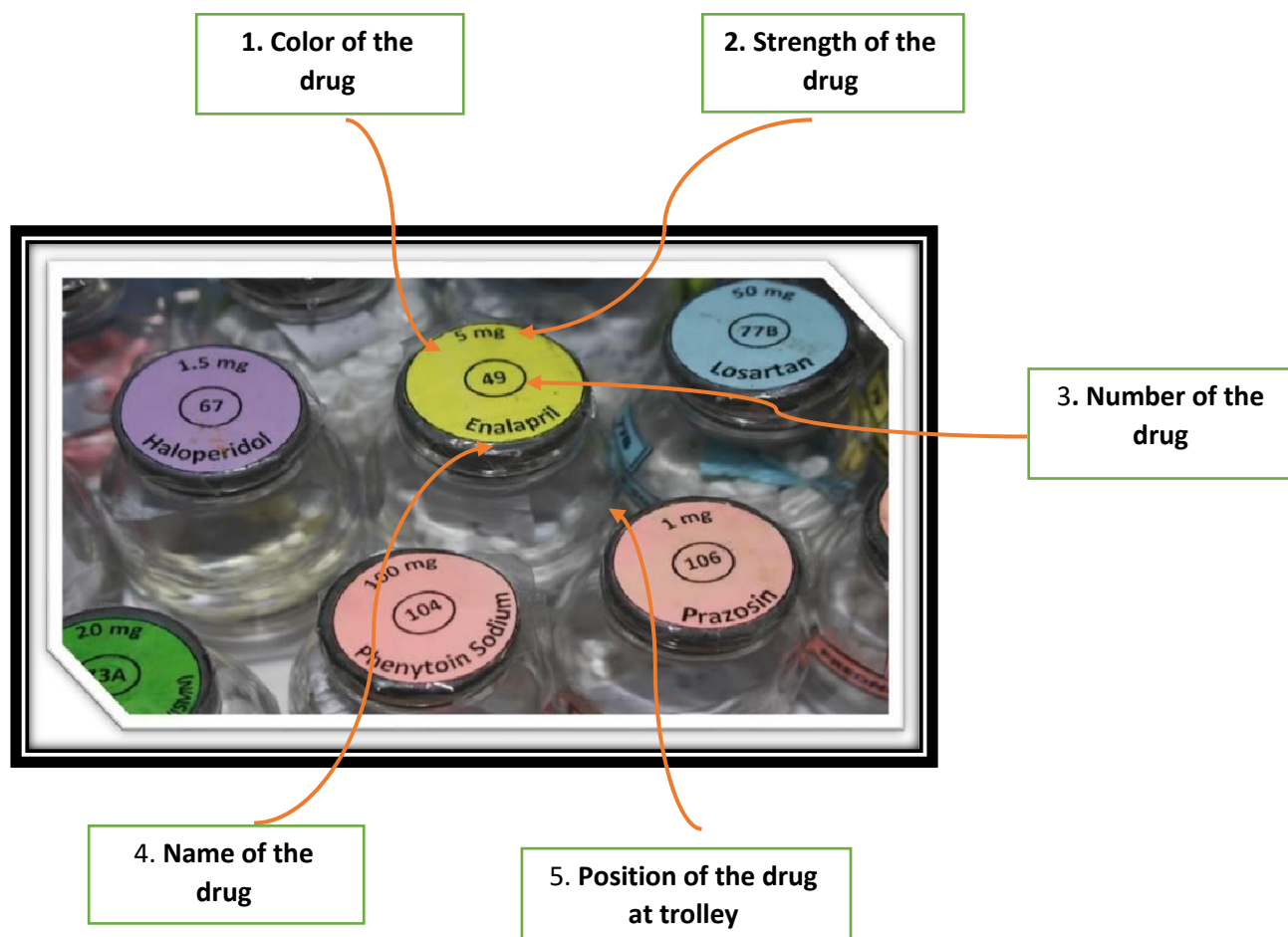

Figure 3: Drug identification number attached at top and side of the bottle
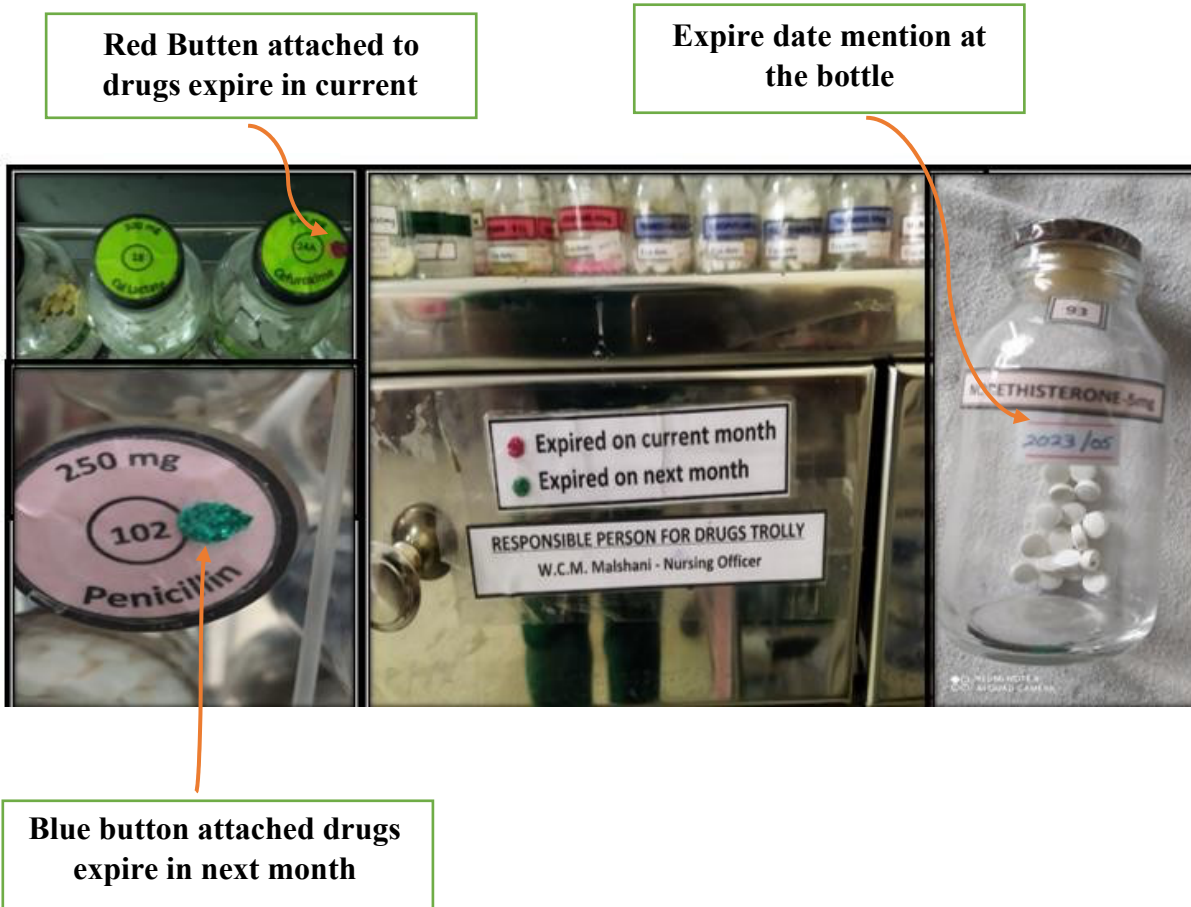
Figure 4: Identification of expiry date of the drug

Red Butten attached to drugs expire in current

Expire date mention at the bottle

Blue button attached drugs expire in next month

Figure 5: Labelling of dangerous drugs for easy Identification to reduce wrong administration

1. Color of the

2. Strength of the drug

5. Star mark of the drug

4. Name of the drug

3. Number of the drug

6. Mention as dangerous drug by large capital letters

Figure 6: Allergic bands

Red band for a patient with drug allergy to identify easily

Green band for a patient without drug allergy to before sending to the theater.

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