PICTURE OF HIGH ALERT MEDICATION STORAGE IN ONE OF THE HOSPITALS IN BANDUNG CITY

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ABSTRACT

A hospital is a health care institution that provides care and treatment for sick or injured people, with various facilities and medical staff. The hospital also functions as a center for medical training and research. One important component in a hospital is proper and correct drug storage, so that drug retrieval will be more efficient and effective. The purpose of this study is to determine the average percentage of suitability for storing High Alert drugs. This study uses descriptive non-experimental research and data collection is carried out by observation. The results of the study show that the storage of high alert drugs in one of the X Hospitals in Bandung City averaged 97.2% in April 2025. Although the storage of High Alert drugs in the Pharmacy Warehouse of

Keywords*: High Alert Drug Storage, Hospital, Pharmaceutical Warehouse*

1. INTRODUCTION

*High Alert*High-alert medications are medications that require caution because they frequently cause errors or serious errors (sentinel events) and medications that have a high risk of causing Adverse Drug Reactions (ADRs). High-alert medications are medications that pose a risk of harming patients if used incorrectly. High-alert medications include medications that look and sound similar (LOOK-Alike-SOUND-Alike/LASA), high-concentration electrolytes, cytostatic medications, and medications used in the ER and ICU. (Ministry of Health, 2022).

High-alert medications require special attention because if they are not used according to their intended function and benefits, they can cause unwanted reactions. Therefore, there are several general principles for handling high-alert medications, namely: (Putri & Usviany, 2023).

1. Medicines that need to be watched out for are stored in locked places such as drawers and cupboards so that they are separated from other medicines.
2. High Alert Medication is labeled with a red label that says “High-Alert” on the front of the packaging and does not cover the drug information.
3. Narcotics are stored in a strong cupboard that is not easily moved and has two different locks.
4. Anesthetic drugs are stored in a place that can only be accessed by doctors, nurses and pharmacy staff.
5. Cytostatic drugs, insulin and heparin should only be stored in the pharmacy or a

locked area when the drug is prescribed.
6. NORUM drugs are stored separately, must not be placed close together and must be labeled "LASA".

Drug storage methods can be carried out based on therapeutic class, dosage form, and type of Pharmaceutical Preparations, Medical Devices, and Medical Expendables and arranged alphabetically by applying the First Expired First Out (FEFO) and First In First Out (FIFO) principles accompanied by a management information system. Storage of Pharmaceutical Preparations, Medical Devices, and Medical Expendables with similar appearance and naming (LASA, Look Alike Sound Alike) are not placed close together and must be given special markings to prevent errors in taking drugs (Ministry of Health Regulation, 2014).

2. RESEARCH METHODS

This study uses a qualitative descriptive method. This study was conducted at the Pharmacy Warehouse of X Hospital, Bandung City in April 2025, with the high alert drug categories evaluated, namely Narcotics and Psychotropic Drugs, Concentrated Electrolyte Drugs and LASA Category Drugs. Data analysis in this study is data from the checklist scored and presented in a table form then the obtained score is calculated based on the criteria, then the percentage range and qualitative criteria include: 81% - 100% (very good), 61% - 80% (good), 41% - 60% (fairly good), 21% - 40% (less good), 0% - 20% (bad) (Fatkhiya & Cahyaningtiyas, 2019).
The percentage of compliance is calculated using the formula:

P=n/N x
100%
Description:
P = Percentage
n = Score obtained
N = Highest or maximum score

3. RESULTS AND DISCUSSION

Table 1. Observation Results of High Alert Storage and Labeling in Pharmaceutical Warehouses

High Alert Medication Storage	Yes	No
The High Alert Drug List is posted in the Pharmacy Warehouse storage room.	√	
High Alert medications are placed separately from other medications.	√	
High Alert drugs in the Psychotropic and Narcotics groups are stored in a cupboard separate with 2 doors and 2 locks	√	
LASA drug storage should be spaced away from 1-2 other drugs.	√	
There is a stock card	√	

There is a warning sign for High Alert Drugs in the form of a red sticker/tape. red	√	
All High Alert Medications in the pharmacy warehouse are labeled with the words High Alert Medication. Alert		√
LASA drugs are stored with LASA stickers	√	

Table 2. Names of LASA Drugs with Different Dosage Strengths

Power I	Power II	Power III	Power IV
Acarbose 50 mg Tablets	Acarbose 100 mg Tablets		
Acyclovir 200 mg Tablets	Acyclovit 400 mg Tablets		
Allopurinol 100 mg Tablets	Allopurinol 300 mg Tablets		
Alprazolam 0.5 mg Tablets	Alprazolam 1 mg Tablets		
Amlodipine 5 mg Tablets	Amlodipine 10 mg Tablets		
Tranexamic Acid 250 mg Injection	Tranexamic Acid 500 mg Injection		
Atorvastatin 10 mg Tablets	Atorvastatin 20 mg Tablets	Atorvastatin 40 mg Tablets	
Bisoprolol 2.5 mg Tablets	Bisoprolol 5 mg Tablets		
Candesartan 8 mg Tablets	Candesartan 16 mg Tablets		
Captopril 12.5 mg Tablets	Captoril 25 mg Tablets	Captopril 50 mg Tablets	
Cefixime 100 mg Tablets	Cefixime 200 mg Tablets		
Clindamycin 150 mg Tablets	Clindamycin 300 mg Tablets		
Codeine 10 mg Tablets	Codeine 20 mg Tablets		
Erythromycin 250 mg Tablets	Erythromycin 500 mg Tablets		
Fenofibrate 100 mg Tablets	Fenofibrate 300 mg Tablets		
Flamicort 10 mg Injection	Flamicort 40 mg Injection		
Flunarizine 5 mg Tablets	Flunarizine 10 mg Tablets		
Glimepiride 1 mg Tablet	Glimepiride 2 mg Tablets	Glimepiride 3 mg Tablets	Glimepiride 4 mg Tablets
Haloperidol 0.5 mg Tablets	Haloperidol 1.5 mg Tablets		
Ibuprofen 200 mg Tablets	Ibuprofen 400 mg Tablets		
Irbesartan 150 mg Tablets	Irbesartan 300 mg Tablets		
Isoniazid 100 mg Tablets	Isoniazid 300 mg Tablets		
Lisinopril 5 mg Tablets	Lisinopril 10 mg Tablets		
Meloxicam 7.5 mg Tablets	Meloxicam 15 mg Tablets		

Methylprednisolone 4 mg Tablets	Methylprednisolone 8 mg Tablets	Methylprednisolone 16 mg Tablets	
MgSo4 20%	MgSo4 40%		
Microgest 100 mg Tablets	Microgest 200 mg Tablets		
Ondansetron 4 mg Tablets	Ondansetron 8 mg Tablets		
Ondansetron 4 mg Injection	Ondansetron 8 mg Injection		
Propranolol 10 mg Tablets	Propranolol 40 mg Tablets		
Pregabalin 75 mg Tablets	Pregabalin 150 mg Tablets		
Ramipril 5 mg Tablets	Ramipril 10 mg Tablets		
Rifampicin 300 mg Tablets	Rifampicin 450 mg Tablets	Rifampicin 600 mg Tablets	
Risperidone 1 mg Tablet	Risperidone 2 mg Tablets		
Salbutamol 2 mg Tablets	Salbutamol 4 mg Tablets		
Simvastatin 10 mg Tablets	Simvastatin 20 mg Tablets		
Spironolactone 25 mg Tablets	Spironolactone 100 mg Tablets		

Table 3. Writing LASA Drugs with Tall Man Lettering

Drug Writing I	Drug Writing II	Drug Writing III
AMOXicillin tablets	**AMP**icillin tablets	
AMLOdipine tablets	**NIFE**dipine tablets	
MEFEnamic acid tablets	TRAMexamic acid tablets	
AZIthromycin tablets	**ERY**thromycin tablets	
ATORVastatin tablets	**SIM**Vastatin tablets	
cefOTAXime injection	cefTIZOXime injection	cefTAZIDime injection
cefTRIAXOne injection	cefazolin injection	
CETIrizine tablets	**FLUNA**rizine tablets	
CIPROfloxacin tablets	**LEVO**floxacin tablets	
ephEDrine injection	ephINEPrine injection	
gliMEPIRide tablets	gliBENCLAMide tablets	
KETOconazole tablets	**FLU**conazole tablets	
ketoROLAC tablets	ketoPROFEN tablets	ketoconazole tablets
methylprednisolone tablets	methylERGOMETRIN tablets	
Methylprednisolone injection	methylERGOMETRIN injection	
novoMIX plex pen	novoRAPID plex pen	
LANSOprazole tablets	**OME**prazole tablets	**PANTO**prazole tablets
OMEprazole injection	**PAN**toprazole injection	

Based on the results of the observations made, it can be seen in table 2 that there are 80 drugs that have the same name with different strengths, the storage of these drugs is given a distance of one or two from other drugs and there is a yellow LASA label. In table 3 there are 39 drugs that should use the Tall Man Lettering method but because the Pharmacy Warehouse of Hospital X, Bandung City does not take or distribute individual drugs but per-dos so it does not use the Tall Man Lettering method.

Table 4. Observation Results of High Alert Storage and Labeling in Pharmaceutical Warehouses Based on Drug Name

Drug Name	Alphabetical	Class Therapy	Marking Label
KCL 7.46 Infusion	√	√	√
NaCl 3% Infusion	√	√	×
MgSo4	√	√	√
Meylon	√	√	√
Dextrose 40%	√	√	√
Calcii Gluconas Injection	√	√	√
Recofol-N	√	√	√
Sevoflurane	√	√	×
Midazolam	√	√	√
Sedacum	√	√	√
Lantus Injection	√	√	√
Novomix Injection	√	√	√
Novorapid injection	√	√	√
Epinephrine injection	√	√	√
Atracium besylate	√	√	√
Neostigmine injection	√	√	√
Rocuronium injection	√	√	√
Dobutamine	√	√	√
Dopamine injection	√	√	√
Oxytocin injection	√	√	√
Pehacain injection	√	√	√
Lidocain injection	√	√	√
Fentanyl injection	√	√	√
Pethidine injection	√	√	√

Table 5. Analysis of calculation results

The total score is appropriate	70
The number of strokes does not match	2
70 + 2 = 72	
P = n/N x 100% P = 79/72 x 100% P = 97.2%	

The observation results from the calculations that have been carried out obtained a score of 97.2%. This shows that the storage of high alert drugs in the Pharmacy Warehouse of Hospital X, Bandung City is in accordance with the Hospital's SOP. The high-alert medication storage process prioritizes the FEFO system, followed by the FIFO system. Medications with closer expiration dates are placed in the front display cabinet, while those with farther expiration dates are placed at the back. A list of high-alert medication names is posted on the high-alert cabinet, which is equipped with red tape at each end of the cabinet. LASA categories are not stored side by side, but are separated by one or two identical drug products. Narcotics and Psychotropics are placed in separate cabinets with two different locks. Based on alphabetical criteria and therapeutic class, all are in accordance, making it easier for pharmacy staff to retrieve medications. Furthermore, the stock card used is running well, as it is always recorded every time a drug is received or sent, and pharmacy staff routinely conducts stocktaking at the end of each month.

However, for high alert label marking, there are still some drugs that have not been labeled, this is due to a lack of human resources so that the time used to carry out labeling is not enough because pharmacy staff must immediately prepare or fulfill the overflow from various rooms which is quite a lot, besides that pharmacy staff must also receive drugs coming from PBF and arrange the drugs then fill in the stock card.

Figure 1. Example of High Alert Medication

4. CONCLUSION

Based on the results of research on the description of High Alert drug storage in the Pharmacy Warehouse Installation of Hospital X, Bandung City, it can be concluded that the high alert drug storage system based on therapeutic class, alphabetical and labeling is very good with a score of 97.2% according to the Minister of Health Regulation Number 72 of 2016.

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