REDUCING THE PERCENTAGE OF FLOOR STOCK MEDICATIONS WITH EXCESSIVE QUANTITY IN THE EMERGENCY AND TRAUMA DEPARTMENT, PORT DICKSON HOSPITAL

Lau Boon Tiang[1], Chin Mei Ping[1], Lai Kok Lun[1], Sim Yi Chi[1], Shio Soon Keat[1], Iffah Izzah Durahman[1], Mohd Nazri Nordin[1], Surekha Kaneson[2], Kanagaletchumi Raju[2], Fairus Fudzam[2]

[1]Pharmacy Department, Port Dickson Hospital, Negeri Sembilan State Health Department, Ministry of Health Malaysia

[2]Emergency and Trauma Department, Port Dickson Hospital, Negeri Sembilan State Health Department, Ministry of Health Malaysia

Corresponding Author: Lau Boon Tiang
Email: lauboontiang@moh.gov.my

Abstract

It is crucial to keep a sufficient amount of safe, unexpired and necessary floor stock medications in the Emergency and Trauma Department (ETD) at all times to deliver timely patient care. However, medication stockpiling or inappropriate accumulation of medication is common and has been shown to cause medication wastage, ineffective treatment or toxic effects due to the medication's expiration. In Port Dickson Hospital, the ETD contributed to 26.1% and 67.7% of floor stock medications with excessive quantity out of all units and wards in 2018 and 2019, respectively. Hence, this quality improvement study aimed to achieve a 50% reduction in floor stock medications with excessive quantity in the ETD of Port Dickson Hospital from the baseline of 11.2% over an approximately one-year duration. A self-administered survey form was distributed among 40 doctors, pharmacy staff, staff nurses and medical assistants to identify the contributing factors. The main contributing factors identified were inefficient management and supervision, non-adherence to standard operating procedures (SOPs) and improper stock management in the ETD. The remedial measures undertaken to solve the problems included appointing an emergency physician, a chief nurse, a chief medical assistant and an in-patient pharmacist to be responsible for stock issues; revising the indent form; reorganising the medication storage area; providing medication storage conditions by the pharmacy department to the ETD staff; reminding medical assistants to return excessive or near expiry medications monthly; reinforcing SOPs on documentation and counter-checking. After five study cycles, the interventions reduced the percentage of floor stock medications with excessive quantity from 11.2% to 1%. Efforts have been made to replicate the remedial measures used in this study in other units and wards, and continuous monitoring is necessary to ensure the effects can be sustained in the long term.

KEYWORDS: Stock management, Excessive medication, Expired medication, Quality improvement

Problem

The Emergency and Trauma Department (ETD) is a hospital's first point of contact to provide timely patient care to those with acute illnesses and injuries (1). In order to deliver immediate healthcare services, it is crucial to keep a sufficient amount of safe, unexpired and necessary floor stock medications in the ETD at all times. However, medication stockpiling or inappropriate accumulation of medication is common and has been shown to cause medication wastage, ineffective treatment or toxic effects due to the medication's expiration (2).

Floor stock medications refer to bulk medications placed in the drug room of the nursing unit (3). Having floor stock medications enable nurses or other medical staff to access the medicines faster without going through an in-patient pharmacy (3). Although floor stock medications are convenient to ward personnel, related problems such as improper medication stockpiling, spoilage, expiration or other storage issues are common. Therefore, regular stock inspection is required in every unit or ward to monitor and ensure the floor stock medications are managed in accordance with the logistics pharmacy management and in-patient pharmacy drug supply guidelines (4,5). For hospitals in Malaysia, pharmacists will conduct ward or unit inspections at least three times a year to ensure the number of medications kept in the ward or unit is in good condition, clean and adequate (5).

In Port Dickson Hospital, previous ward inspection reports showed that the ETD contributed to 26.1% (MYR843.94≈USD209.09) and 67.7% (MYR3,660.70≈USD884.06) of floor stock medications with excessive quantity out of all units or wards in 2018 and 2019, respectively. A verification study conducted from October to November 2019 reported that the ETD topped the list with 11.2% of floor stock medications with excessive quantity, which was reflected by the unsatisfactory ward inspection of the department, lingering between grade C (70-80%) and grade D (<70%) throughout the years. Most of the time, these excessive floor stock medications will be expired or spoiled before being utilised.

This study was conducted in the Pharmacy Department and the ETD of Port Dickson Hospital. Port Dickson Hospital is one of the leading hospitals caring for an estimated 1.13 million population in Negeri Sembilan, Peninsular Malaysia (6). During the study period, there were three emergency physicians, 20 medical officers, 32 medical assistants, 11 staff nurses and 32 supporting staff serving the ETD. The medical officers and specialists in the ETD attend to approximately 1,500 to 2,000 patients and prescribe about the same number of prescriptions every month. With a high volume of patient visits, approximately 100 types of floor stock medications were kept in the unit: 20.2% for blood and blood-forming organs, 15.4% for the nervous system, 12.5% anti-infectives for systemic use, 9.6% for alimentary tract and metabolism, and 8.7% for the respiratory system, among others. The majority (63.5%) of the medications were injectables. There were 42 staff working in the Pharmacy Department, including 23 pharmacists, six pharmacy assistants and 13 supporting staff. The in-patient pharmacy is responsible for consistently supplying floor stock medications to all units and wards, as well as monitoring their stock levels every four months through ward inspection.

Although the verification study showed that the ETD had only 11.2% of floor stock medications with excessive quantity, it could still impact patient safety, as well as cause medication error and cost wastage. Therefore, the general objective of this study was to achieve a 50% reduction in floor stock medications with excessive quantity in the ETD from the baseline of 11.2% over approximately a one-year duration.

Background

Excessive floor stock medications has always been a concern in the health care system due to its significant impacts. For example, in 2015, Malaysian Auditor General's Report highlighted that one of the hospitals in Malaysia had wasted MYR308,373

(≈USD78,983) due to unused medicinal drugs (7). In addition, a study done by Lee et al. (2) showed that approximately 28% of the floor stock medications were returned to the pharmacy department because they were excessive in quantity, with some being expired. Therefore, good stock management is necessary to keep costs down, ensure good patient care and prevent mistakes or fraud (8).

According to Aziz et al. (9), unnecessary disposal of drugs stored in the ward can be attributed to three significant factors: ward personnel do not check the stock level, inadequate checking on the drug received and not practising the principle of First-In-First-Out (FIFO). Papalexi et al. (10) identified that the root cause of medication wastage stemmed from a few factors. Firstly, some procedures were not carried out as they should have, e.g., stock checks were not done by pharmacists, leading to medications expiring unknowingly. Secondly, ward personnel ordered higher medication quantities than needed, i.e., practice unnecessary stock holding. Thirdly, poor communication between the stakeholders leads to increased wastage.

A few strategies are available to solve the problems related to inventory management and stock control. Firstly, leaders or supply managers must inspire and guide the staff on proper inventory control (11,12). Secondly, an updated standard list of stock items needs to be maintained as it is crucial to keep the stock in check (11,12). Thirdly, the relevant ward can practise the principle of FIFO and ensure timely disposal of slow-moving or overstocked items to avoid items expiring before utilisation (12). This can be done by applying lean philosophy, enabling pharmacists to manage their stock correctly and eliminate waste (10). Besides, seminars and facilitated workshops should be organised to address excessive stock holding issues and encourage communication between pharmacists and doctors (10,12).

Moreover, automated drug dispensing cabinets (ADCs) were introduced to improve medication delivery (13,14). This equipment has been proven to be able to reduce the weekly stockout percentage, improve the average medication turnaround time and reduce potential product expiration (13). Besides that, higher user satisfaction and reduced medication process errors were reported with the application of ADCs (14). This technology is currently available in certain private and teaching hospitals in Malaysia.

Measurement

This quality improvement study was conducted from October 2019 to November 2021. The floor stock medications with excessive quantities detected by pharmacists during ward inspection were included in this study. Patient-own-medicines (POMs), medications prescribed to the patients in the ETD but were not on the floor stock list, and excessive medications that have already been recorded and kept aside to be returned to the Pharmacy Department were excluded from this study. The percentage of floor stock medications with excessive quantity in the ETD was used as the indicator for improvement. The percentage was calculated using the formula below:

$$\textit{Percentage of floor stock medications with excessive quantity in the ETD} = \frac{\textit{Number of medications with excessive quantity detected during ward inspection}}{\textit{Total number of medications in the floor stock list}} \; X\,100\%$$

For example, if ipratropium nebulising solutions, captopril 25mg tablet and metoclopramide 10mg ampoule were detected to have excessive quantities of 10 respules, five tablets and three bottles, respectively, during ward inspection, the number of floor stock medications with excessive quantities will be counted as 3, irrespective of the total amount of the excessive medications. The standard was set at 5.6%, which was a 50% reduction from the baseline of 11.2% in the verification study, as adopted by Lee et al. (2019) (2) and agreed upon in the cross-departmental meeting between the head of the Pharmacy Department and ETD.

Data for the indicator were retrieved from the ETD ward inspection reports throughout the study period. For example, the list of floor stock medications with excessive quantities, together with the expired medications and the costs involved, were identified from the reports. In addition, the indent forms (refer to Appendix 1) sent from the ETD to the Pharmacy Department were checked to extract data on the critical

steps of indenting and supplying floor stock medications.

Initial Assessment of the Problem

Several sessions were conducted to brainstorm the factors leading to excessive floor stock medications in the ETD. Subsequently, a set of a questionnaire consisting of 15 items was designed and distributed to 40 doctors, pharmacy staff, medical assistants and nurses in the Pharmacy Department and the ETD to collect their opinion regarding the contributing factors to excessive floor stock medications. Data collected from the survey were converted into a Pareto chart to determine the major contributing factors. Based on the Pareto principle, three primary factors were identified: inefficient management and supervision (26.8%), non-adherence to standard operating procedures (SOP) (24.7%) and improper stock management in the ETD (21.3%), which collectively contributed to around 80% of all the contributing factors (15). The details are shown in Table 1 and Figure 1.

Table 1: Factors leading to excessive floor stock medications in the Emergency and Trauma Department

Factor	n (%) [a]
A. Inefficient management and supervision	
1. Poor dissemination of information regarding ward inspection results to all ETD staff	18 (28.6)
2. No designated personnel to oversee stock issue in the ETD	15 (23.8)
3. Insufficient ward inspection by the Pharmacy Department	13 (20.6)
4. No feedback from the ETD to the Pharmacy Department after each ward inspection	9 (14.3)
5. Outdated floor stock indent form	8 (12.7)
TOTAL	63 (100)
B. Non-adherence to SOP	
1. No returning of extra or expired medications from the ETD to the Pharmacy Department	16 (27.6)
2. Over indent floor stock medications by the ETD	16 (27.6)
3. Lack of counter-checking process from both departments	14 (24.1)
4. Oversupply of floor stock medications by the Pharmacy Department	12 (20.7)
TOTAL	58 (100)
C. Improper stock management in the ETD	
1. Improper storage space	27 (54.0)
2. Over-storage of unneeded medications	23 (46.0)
TOTAL	50 (100)
D. Inexperienced staff	
1. No reward mechanism	21 (55.3)
2. Lack of awareness	17 (44.7)
TOTAL	38 (100)
E. Inconsistent drug usage pattern	
1. Unpredictable types of cases	16 (61.5)
2. Different prescribing habits	10 (38.5)
TOTAL	26 (100)

[a] *n = number of responses*

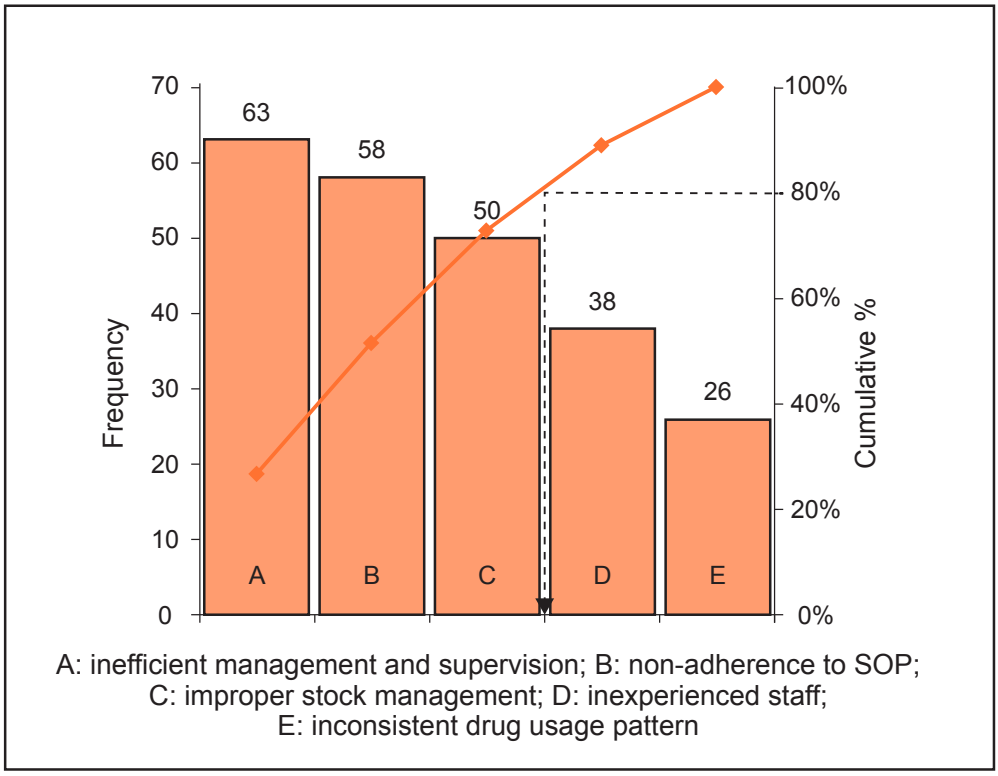


Figure 1: Contributing factors to excessive floor stock medications in the Emergency and Trauma Department

Apart from the questionnaires, the floor stock medication indent forms and ward inspection reports from the ETD throughout the study period were reviewed in this study. Two team members collected and analysed all indent forms sent to the Pharmacy Department one month before the ward inspection. For example, if ward inspections were scheduled in March, the floor stock medication indent forms sent to the pharmacy in February were collected and analysed. Subsequently, the data were counter-checked by the other team members.

The current process of care involving indenting and supplying floor stock medications was also reviewed to identify the critical steps for improvement. The critical steps in indenting floor stock medications included checking and recording stock balance in the floor stock medication indent forms, receiving medications from the in-patient pharmacy and storing medications. The verification study showed that more than half (57.7%, n=15) of the reviewed floor stock medication indent forms (n=26) did not have stock balance recorded and 42.3% (n=11) were not completed with signatures during the medication indenting process. In addition, when receiving supplies from the in-patient pharmacy, 30.8% (n=8) of the ETD staff did not check the supplies nor sign the indent forms. During ward inspection, it was also found that some medications were not stored in the correct container or at the proper temperature. For instance, paracetamol suppositories that were supposed to be stored at room temperature were wrongly stored in the refrigerator. Therefore, proper medication storage was included as one of the critical steps in this study. Nonetheless, 98% (96 out of 98) of the floor stock medications checked during the verification study were stored in the correct container and at the correct temperature. Noteworthily, some medications were found expired during ward inspection as the First Expired, First Out (FEFO) concept was not applied. However, 97 out of 98 (99%) floor stock medications checked during the verification study were not expired. In short, due to irregular shifts, heavy workloads and shortages in the workforce, the balance of floor stock medications was not adequately checked and recorded by medical assistants before the indenting process. The same

factors might have also led to the lack of counter-checking and improper storage of floor stock medications after receiving them from the pharmacy.

On the other hand, critical steps involving the Pharmacy Department included ensuring the indent forms were completed with the stock balance in the ETD and the signature of the ETD staff, counter-checking the number of medications supplied to the ETD and signing the indent forms. The verification study reported that out of the total indent forms (n=26) received by the pharmacy staff, 53.8% (n=14) were without recorded balance and 42.3% (n=11) were without ETD staff's signatures. Besides, 53.8% (n=14) of the indent forms were not counter-checked nor signed by the pharmacy staff. Due to the lack of awareness among new staff and shortage of the workforce on certain days, e.g., public holidays and weekends, the balance of floor stock medications in the ETD and the quantity of the medications supplied might not have been checked by the pharmacist upon the supplying process. The process of care is shown in Figure 2. The verification study result is shown in Table 2.

Strategy

Following the identification of the contributing factors, a total of six remedial actions or strategies were implemented in this study. The first two strategies were implemented from February to July 2020 (Cycle 1), another two strategies were implemented from August to November 2020 (Cycle 2), and the last two strategies were implemented from December 2020 to March 2021 (Cycle 3). The effects of the strategies were re-evaluated two times from June to July 2021 (Cycle 4) and from October to November 2021 (Cycle 5).

Cycle 1 focused on tackling the issue of inefficient management and supervision. Before this quality improvement study, there was no designated personnel for stock management in the ETD. There was also inadequate dissemination of ward inspection reports among the ETD staff and no feedback was collected from the ETD staff after each ward inspection, leading to persistent mistakes in managing floor stock medications. Hence, one of the strategies was to appoint an ETD specialist, a chief medical assistant and a chief nurse to oversee stock issues in the ETD and update the in-patient pharmacist-in-charge via email on the improvement made within one month after each ward inspection. This strategy can ensure that the person-in-charge (PIC) knows about the latest condition of floor stock medications, provides timely corrections and prevents repetitive mistakes. The second strategy implemented in Cycle 1 involved revising the outdated floor stock medication indent form, which had caused unnecessary indent of slow-moving and unnecessary items. Before this study, the indent form was seldomly revised and would only be updated upon request. In Cycle 1, the indent form was updated after discussing with the ETD PIC and the in-patient pharmacist to remove infrequently used items and adjust the amount required for other medications. Besides, an agreement was reached between both parties that the indent form shall be revised at least once a year. The indent form was revised three times throughout the study period. The remedial actions implemented in Cycle 1 resulted in a 0.8% reduction of achievable benefits not achieved (ABNA).

In Cycle 2, strategies were developed to improve existing floor stock medication management in the ETD. Before this study, the same floor stock medications were kept in a few places, leading to excessive indenting as the ETD staff was unaware that the medications were available in other areas. Therefore, discussions were held between the in-patient pharmacist and the ETD PIC to reorganise the storage area to accommodate more floor stock medications so that all the medications can be stored in one single storage area. This strategy will also enable the ETD PIC to monitor floor stock levels more effectively. In addition, the Pharmacy Department developed two new guidelines, i.e., a list of medications that shall be kept in the refrigerator and an Injectable Drugs Guide for Adult Patients to facilitate the ETD

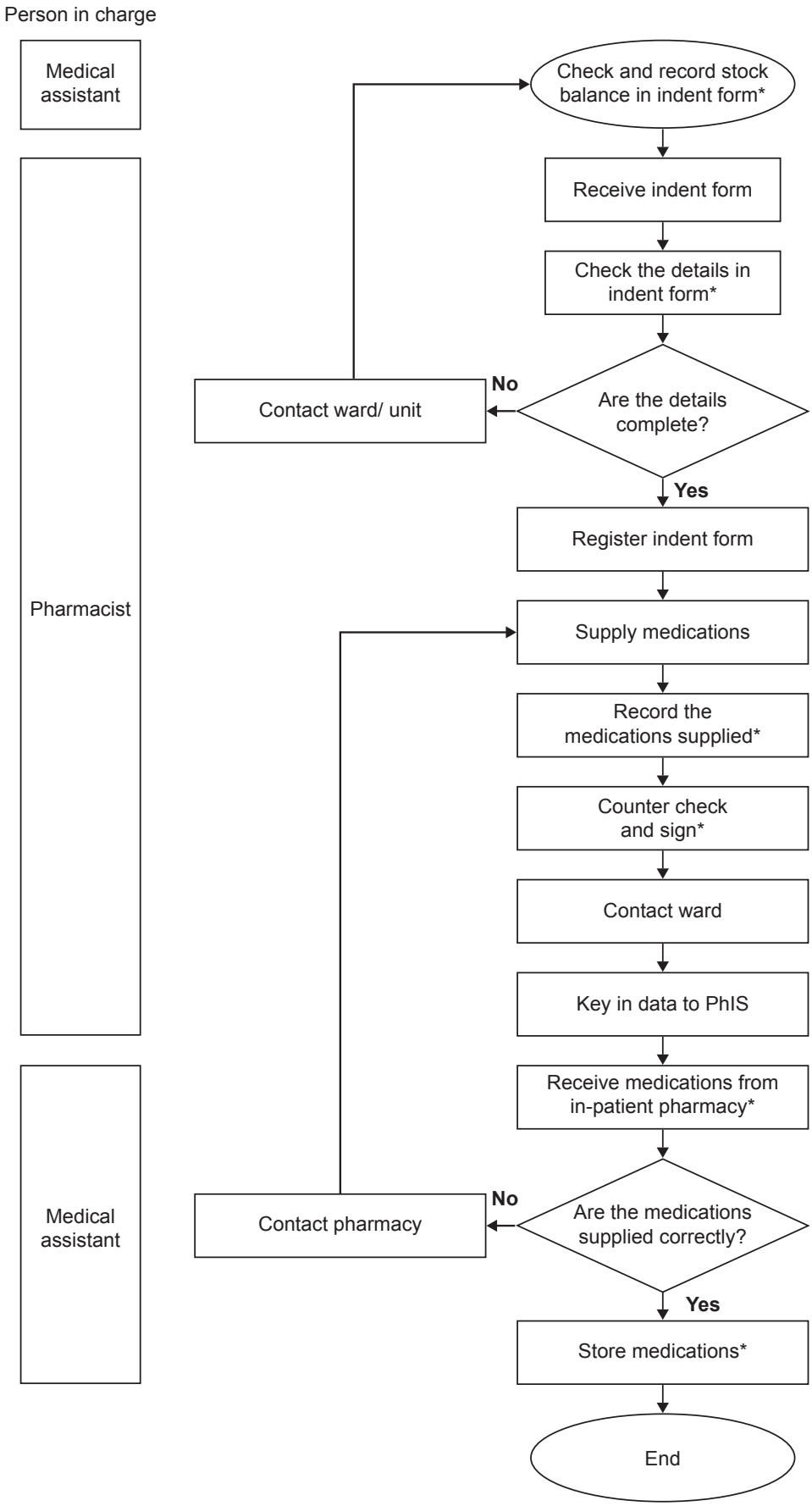


Figure 2: Process of care for indenting and supplying floor stock medications (* indicates critical steps)

Note:
PhIS: Pharmacy Information System

Table 2: Critical steps in indenting and supplying floor stock medications by the Emergency and Trauma Department and the Pharmacy Department

Step	Process	Criteria	Standard	Verification Study	Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5
Indenting (by the Emergency and Trauma Department)									
1.	Check and record stock balance in indent form	• Prepare indent form in duplicate	100%	100%	100%	100%	100%	100%	100%
		• Record current stock balance	100%	42.3%	16.7%	25%	60%	66.7%	69%
		• Indent quantity not more than the maximum allowable amount	100%	92.3%	91.7%	100%	84%	100%	100%
		• Sign the indent form	100%	57.7%	100%	96.4%	100%	100%	100%
		• Record usage of list A items	100%	92.3%	100%	100%	100%	100%	100%
2.	Receive medications from an in-patient pharmacy	• Check the quantity supplied	100%	69.2%	100%	92.9%	100%	93.9%	96.6%
		• Sign the indent form	100%	69.2%	100%	92.9%	100%	93.9%	96.6%
3.	Store medications	• Stock medications at designated places (e.g., fridge)	100%	98%	95.2%	95.8%	100%	100%	100%
		• Arrange medications according to FEFO	100%	99%	97.1%	100%	100%	100%	100%

Supplying (by the Pharmacy Department)									
4.	Check details in the indent form	• Ensure current stock balance is recorded	100%	46.2%	16.7%	25%	68%	66.7%	69%
		• Ensure the quantity indented is not more than the maximum allowable amount	100%	92.3%	91.7%	100%	84%	100%	100%
		• Ensure the indent form is signed	100%	57.7%	100%	96.4%	100%	100%	100%
		• Ensure usage of list A items is recorded	100%	96.2%	100%	100%	100%	100%	100%
5.	Record medications supplied	• Ensure the quantity supplied is not more than the maximum allowable amount	100%	88.5%	91.7%	100%	100%	100%	100%
6.	Counter-check and sign the indent form	• Ensure the indent form is signed by the staff who supplies the medications	100%	92.3%	100%	100%	92%	100%	100%
		• Counter-check the quantity supplied	100%	46.2%	58.3%	57.1%	72%	97%	96.6%
		• Ensure the counter checker signs the indent form	100%	46.2%	66.7%	57.1%	72%	97%	96.6%

staff in keeping the medications according to the correct temperature requirement. Despite implementing the remedial actions, the percentage of floor stock medications with excessive quantity increased from 4.8% to 10.5% at the end of Cycle 2.

In Cycle 3, the relevant SOPs were revised and reinforced. Before this study, excessive or expired medications were stocked up in the ETD without returning them to the in-patient pharmacy every month. In addition, there was no monitoring system in place to ensure the correct execution of SOPs related to medication return. This issue was highlighted to the ETD PIC, and medical assistants were reminded to return excessive or near-expiry medications to the in-patient pharmacy every month. On top of this strategy, the SOP on indenting and supplying floor stock medications was enforced in both departments to ensure proper documentation and counter-checking procedures. For example, pharmacy staff should reject the indent form during the medication indenting process if there are no stock balance records and signatures on the indent form. At the same time, pharmacy staff was also obliged to counter-check the medications supplied and sign at the designated columns during the supply and counter-checking processes. These remedial actions reduced the percentage of floor stock medications with excessive quantity to 5% at Cycle 3.

The re-evaluations conducted in Cycle 4 and Cycle 5 showed that the percentage of floor stock medications with excessive quantity was 5% and 1%, respectively. Both ETD and the Pharmacy Department showed improvement at the critical steps, although not achieving 100% due to inexperienced or new staff working on the weekend and public holiday shifts.

Results

During the verification study, 11 out of 98 (11.2%) floor stock medications in the ETD were found to have excessive quantities, and 1 (1%) of the floor stock medications were found to be expired. Among the 11 medications, the nebulising solution had the highest excess quantity. In Cycle 1 of this study, 5 out of 105 (4.8%) floor stock medications had excessive quantities, in which 4 of the medications were intravenous drips, and 3 (2.9%) floor stock medications were found to be expired. The percentage of floor stock medications with excessive quantity increased to 10.5% (10 out of 95) in Cycle 2, with 5 out of 10 floor stock medications being respiratory medications. No medication was found to be expired in Cycle 2. In Cycle 3, most processes were improved with proper remedial actions. There were 5 out of 100 (5%) floor stock medications with excessive quantities, and no medication expired. Further improvement was observed in Cycle 4 and 5. The standard set and ABNA for this study are depicted in Figure 3. The details are shown in Table 2.

An overall reduction in wastage cost due to excessive stock-keeping in the ETD was also observed in this study from MYR208.51 (≈USD50.36) in the verification study period to MYR39.88 (≈USD9.50) in Cycle 1, then MYR351.51 (≈USD83.73) in Cycle 2, MYR177.60 (≈USD4.25) in Cycle 3, MYR17.48 (≈USD4.22) in Cycle 4 and finally MYR5.00 (≈USD1.21) in Cycle 5.

Improvement was also observed in the ward inspection performance of the ETD after the implementation of the remedial actions from grade C during the verification study to grade B in Cycle 5 of this study.

Lessons and Limitations

In this study, the effectiveness of the remedial actions taken was affected by unforeseen circumstances. Despite implementing the remedial actions, excessive medication trends were erratic due to the COVID-19 pandemic. The management of floor stock medications in the ETD became challenging due to the shift in the types of diseases encountered, i.e., more efforts were made to concentrate on respiratory diseases from 2020 onwards. The management of floor stock medications became tougher with staff mobilisation to help in the COVID-19 treatment centres, long working hours and

physical and mental burnout among the ETD staff. This phenomenon was in line with the studies that reported that healthcare workers suffered stress during the pandemic (16-18), which affected workplace performance. The consequences of the COVID-19 pandemic could be seen in Cycle 1 (the end of the second COVID-19 wave) and Cycle 2 (the start of the third COVID-19 wave), where weaker performances in floor stock medication management were portrayed.

The increment of ABNA during Cycle 2 could be attributed to several factors. Firstly, changes in the disease(s) or condition(s) being managed in the ETD resulted in different types of medications becoming excessive in the department. This highlighted that the environment of the ETD is dynamic and the challenges faced by the department are constantly changing. For example, nebulising solutions were commonly detected to be in excessive quantity during ward inspection in Cycles 1 and 2 because more presumed COVID-19 patients were managed in the ETD during that period and pressurised metered-dose inhalers were used instead of nebulising solutions to reduce the spreading of the virus through nebulisation. This practice was consistent with the treatment guideline suggested by the Malaysian Thoracic Society (19). Hence, continuous monitoring of floor stock medications by the ETD and Pharmacy Department is essential to ensure the quantities of the medications do not become excessive while remaining appropriate for current conditions.

Secondly, staff were not familiar with the SOPs. Therefore, inexperienced staff should be continuously educated on proper workflow and SOPs through continuing medical education. Also, alternative methods, such as webinars or online briefings, had to be sought after in abiding to the SOP. Thirdly, shifts in staffing during the COVID-19 pandemic were unpredictable, limiting the execution of remedial actions. The consequences were evident in Cycle 2 when staff was mobilised to the COVID-19 treatment centres. Finally, the data were only obtained from the ward inspection period. In this study, the number of

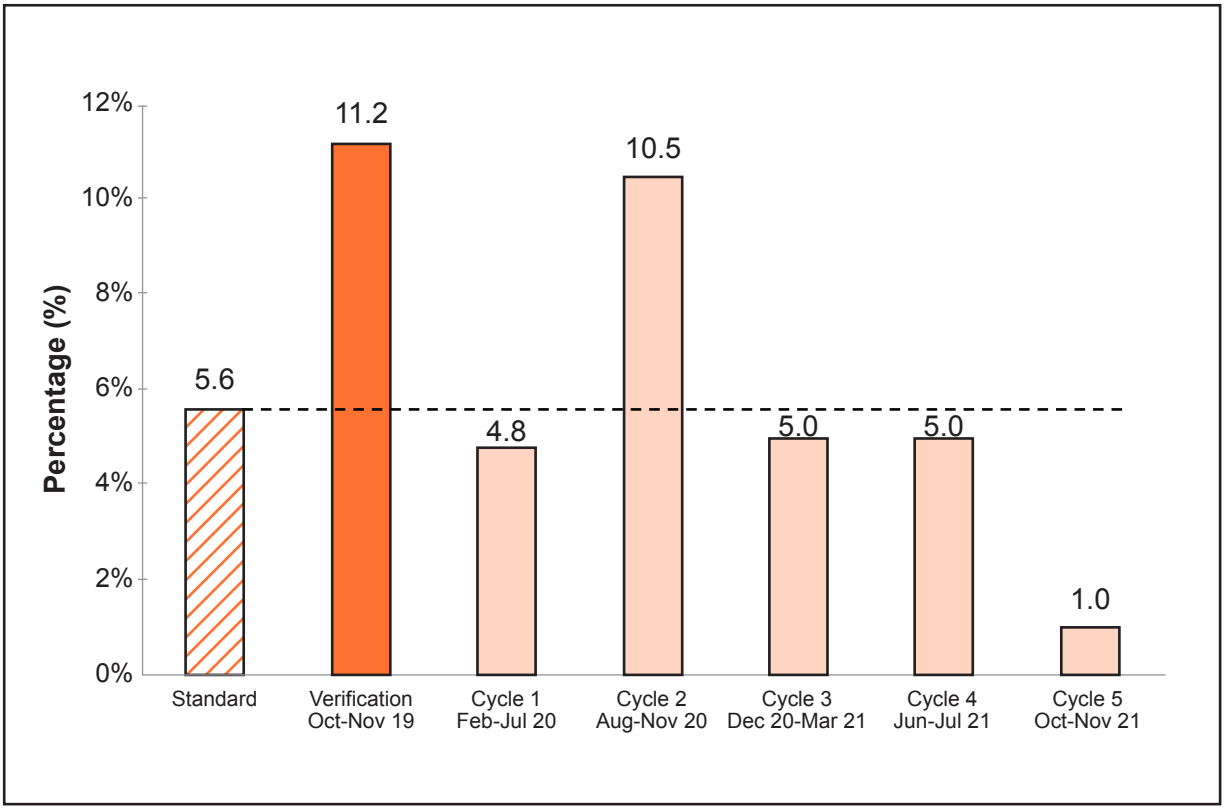


Figure 3: Achievement of the indicator by cycles

ward inspections reduced from three to two times a year in 2020 due to COVID-19, which could have affected the observed results.

Despite the limitations, there were lessons learnt through this study. It was noteworthy that improvement in the management of floor stock medications mainly stemmed from the PIC, i.e., specialist, chief medical assistant, chief nurse and pharmacy staff. Although the PIC might not be directly involved in the whole process of care, persistent effort from the PIC in monitoring and strengthening SOPs was crucial to reducing excessive floor stock medications in the ETD. This finding has underscored the importance of a multidisciplinary approach at the management level, e.g., through group discussion or dialogues, to ensure the target set can be attained efficiently and effectively. Besides, it was observed that frequent revision was essential to maintain the necessary types and numbers of medications in the ETD, especially during this pandemic. Even though it was impractical to change the list constantly, the practice of returning unused or excessive medications to the in-patient pharmacy could prevent medications from expiring unknowingly. Notably, adherence to SOPs should be highlighted, especially in counter-checking and recording the balance of medications before indenting and supplying processes. This is because the strategies planned would be in vain without proper adherence to SOPs. We believed that the strategies implemented in this study were essential and could be replicated in other units or hospitals involving medication stock management.

Conclusion and the Next Steps

This study successfully reduced the percentage of floor stock medications with excessive quantity in the ETD to the targeted percentage of 5.6% from 11.2% in the pre-intervention phase and subsequently to 1% post-implementation of strategies. Besides, there was also an overall reduction in the wastage cost, as well as improvements in ward performance in terms of medication stock management. Furthermore, the same strategies have been replicated in all other units/wards in Port Dickson Hospital, and the authors expect more reduction of excessive medications and wastage costs throughout the year.

The QA team will monitor the work processes continuously to ensure targets are achieved in the hospital. Implementing electronic recording through the Pharmacy Information System (PhIS) can help ensure proper medication tracking and reduce the workload from manual recording and counter-checking. Discussions regarding the implementation of electronic recording through PhIS will be conducted through meetings and seminars, and efforts from all stakeholders are required to make it successful in the future.

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Conflict of Interest

The authors declare that there was no conflict of interest.

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Appendix 1

Example of floor stock medication indent form kept in the Emergency and Trauma Department, Port Dickson Hospital

TARIKH:.....

Farmasi RN:.....

BIL		MIN	MAX	BAKI	PESAN	BEKAL
	UBAT BUI					
1	Charcoal Activated Granules 50g	2	4			
2	Acetylsalicylic Acid 300 mg Soluble Tablet	10	20			
3	**Clopidogrel 75 mg Tablet*** **	15	30			
4	Glyceryl Trinitrate 0.5 mg Tablet (30 tab)	1	2			
5	Captopril 25mg Tablet	10	20			
	CREAM, LOTION, SOLUTION					
1	Alcohol 70% Solution (240mL)	2	4			
2	Cetrimide 1% Lotion (120mL)	4	8			
3	Chlorhexidine Gluconate 5% Solution	500ML	1 L			
4	Formalin 10% Buffered Solution	3.8L	3.8L			
5	Hydrogen Peroxide 20 volume Solution (6%)	500ML	1 L			
6	Silver Sulfadiazine 1% Cream	250 G	500 G			
7	Ether Solvent	250 mL	500 mL			
8	Chlorhexidine 1 in 200 (0.5%) in Alcohol 70% (240mL)	2	4			
9	Chlorhexidine Gluconate 2% in Alcohol 70% Solution	1 (EB)	2 (EB)			
10	Povidone Iodine 10% Solution (60mL)	5	10			
11	Acriflavine 0.1% Lotion	5	10			
	EYE/EAR DROP/OINTMENT					
1	Chloramphenicol 1% Eye Ointment	5	10			
2	Chloramphenicol 0.5% Eye Drops	5	10			
3	Chloramphenicol 5% w/v Ear Drops	3	5			
	IV DRIP					
1	Dextrose 5% 500ml IV soln (D5%)	10	20			
2	Dextrose 10% 500mL IV soln (D10%)	10	20			
3	Modified Fluid Gelatin 4% 500mL IV Solution (Gelofusine)	2	5			
4	Sodium Chloride 0.45% 500mL IV soln (HS)	5	10			
5	Sodium Chloride 0.45% with Dextrose 5% 500mL IV soln (HSD5)	10	20			
6	Sodium Chloride 0.9% 100mL IV soln (NS)	10	20			
7	Sodium Chloride 0.9% 500mL IV soln (NS)	40	80			
8	Sodium Lactate Compound 500mL IV soln (HM)	20	40			
9	Sodium Chloride 0.9% 500mL Irrigation Soln	5	10			
10	Sodium Chloride 0.9% 3L Irrigation Soln	1	4			
11	Sodium Cl, Sodium Ace, Malic Acid, Calcium Cl, Potassium Cl, Magnesium Cl (Sterofundin) 500ml IV Sol	5	10			
12	Sterile Water for Irrigation 500mL	5	10			
	UBAT LAIN					
1	Ethyl Chloride Spray	3	5			
2	Fuller's Earth Powder	1	3			
3	Ipratropium Bromide 0.025% Nebulising Soln (250 mcg/ml) UDV	20	40			
4	Ipratropium Br 0.5mg, Salbutamol 2.5mg Neb (UDV)	30	60			
5	Glucose Powder	1	3			
6	Lignocaine (Lidocaine) 10 % w/w Spray	1	3			
7	Lignocaine 2% Jelly	3	5			
8	Paracetamol 125 mg Suppository	10	20			
9	Paracetamol 250 mg Suppository	10	20			
10	Salbutamol 0.5 % Nebulising Solution	5	10			
11	Terbutaline Sulphate 10 mg/ml Nebulising Solution	1	3			
12	Budesonide 1 mg/2 ml Nebulising Solution (Respules)	3	5			
13	Salbutamol 100 mcg/dose Inhaler (200 doses)	1	5			
14	Sodium Dichloroisocyanurate 2.5g Tablet	1	1			
	UBAT NEUROMUSCULAR PARALYTIC					
1	Atracurium Besylate 25mg/2.5ml Injection	1	3			
2	Neostigmine Methylsulphate 2.5mg/ml Injection	1	3			
3	Propofol 1% Injection (200mg/20ml Vial)	1	3			
4	Rocuronium Bromide 10mg/ml Inj	1	3			
5	Suxamethonium Chloride 50 mg/ml Inj	5	10			

BIL		MIN	MAX	BAKI	PESAN	BEKAL
	UBAT SUNTIK					
1	Insulin regular (Actrapid) 100 IU/mL Vial	1	3			
2	Acetylcysteine 5000mg/25ml Injection	3	5			
3	Aminophylline 25mg/ml	3	5			
4	Antivenene Cobra Injection	1	5			
5	**Hematotoxic Polyvalent Snake Antivenom**	1(EB)	1(EB)			
6	**Neurotoxic Polyvalent Snake Antivenom**	1(EB)	1(EB)			
7	Antivenene Serum Sea snake 1000 units Injection	1(EB)	1 (EB)			
8	Calcium Gluconate 10% Injection	3	5			
9	Chlorpheniramine 10mg/ml Injection	10	20			
10	Dexamethasone Sodium Phosphate 4mg/ml	10	20			
11	Dextrose 50% 10mL Inj	10	20			
12	Diclofenac Sodium 75mg/3 ml Injection	25	50			
13	Enoxaparin 40mg Injection	5	10			
14	Fondaparinux 2.5 mg/0.5ml Injection	5	10			
15	Frusemide 10mg/ml	10	20			
16	Haloperidol 5 mg/ml Injection	3	5			
17	Heparin Sodium 5000 IU/ml Injection (5ml)	1	3			
18	Heparin Sodium 50 IU/5ml in Sodium Chloride Injection (heparin in NaCl)	10	20			
19	Hydrocortisone Sodium Succinate 100mg Inj	20	40			
20	Hyoscine N-Butylbromide 20mg/ml Injection	10	20			
21	Labetalol HCl 25 mg/5 ml Injection	5	10			
22	Levetiracetam 100mg/ml Injection	2	5			
23	LIGNOcaine HCl (Lidocaine) 2% Injection (10ml)	10	20			
24	Metoclopramide HCl 10mg/2ml Injection	25	50			
25	Oxytocin 10 units/ml Injection	1	3			
26	Oxytocin 5U + Ergometrine 0.5mg/ml Inj	1	3			
27	Sodium Valproate 400 mg Injection	1	3			
28	Pantoprazole 40mg Injection	10	20			
29	Vitamin B and C (P-Trovite) 10mL Inj	1 Pair	3 Pair			
30	Potassium Chloride 1g/10ml Injection	5	10			
31	Prochlorperazine Mesylate 12.5 mg/ml Inj	5	10			
32	Promethazine HCl 25 mg/ml Injection	5	10			
33	Ranitidine 50mg/2ml Injection	20	40			
34	Sodium Bicarbonate 8.4% (1 mmol/ml) Injection	20	40			
35	Paracetamol 10mg/ml in 100ml solution	3	5			
36	Streptokinase 1,500,000 IU Injection	1 (EB)	3 (EB)			
37	Terbutaline Sulphate 0.5mg/ml Injection	5	10			
38	Tenecteplase 10,000 unit (50mg) Injection	1(EB)	2 (EB)			
39	Tetanus Toxoid Injection (10 doses)	5	10			
40	Thiamine HCl 100mg/ml Injection	2	5			
41	Tramadol HCl 50 mg/ml Injection	25	50			
42	Tranexamic acid 100mg/ml Injection	5	10			
43	Verapamil HCl 5mg/2ml Injection	3	5			
44	Vitamin K1 (Phytomenadione) 10 mg / ml Injection	3	5			
45	Sterile Water for Injection 10mL	25	50			
	UBAT SUNITK ANTIBIOTIK					
1	Amoxicillin 1g + Clavulanate 200mg Injection	10	20			
2	Ampicillin 1g + Sulbactam 500mg Injection	3	5			
3	Ceftriaxone 1g Injection	3	5			
4	Cefuroxime 750mg Injection	3	5			
5	Metronidazole 500mg/100ml Injection	3	5			

***** Kegunaan ubat kategori A perlu dicatat dalam buku rekod.**

EB ***Exchange basis***