Research Article

# Waste in Drug Procurement Process in Pharmacy Department Santa Maria Hospital Pemalang, Indonesia

**Tjia Lilian Trisnawati Prasetya[1,2], Erna Kristin[3], Trisasi Lestari[4]**

[1]Graduated Student of Hospital Management Graduate Program, Faculty of Medicine, Gadjah Mada University, Yogyakarta, Indonesia.
[2]Santa Maria Hospital, Pemalang, Indonesia.
[3]Department of Pharmacology and Therapy, Faculty of Medicine, Gadjah Mada University, Yogyakarta, Indonesia.
[4]Hospital Management Graduate Programme, Gadjah Mada University, Yogyakarta, Indonesia.
***Corresponding author's E-mail:** lilian_prasetya@yahoo.com

**Accepted on:** 13-01-2015; **Finalized on:** 28-02-2015.

**ABSTRACT**

The objective of the study is to identify the root cause of the problem of waste in the drug procurement process in Santa Maria Hospital pharmacy, Pemalang, Indonesia using lean management approach. Case study research design of explanatory type, data retrieval derived from study of documents, observation and focus group discussions. Pharmacy department of Santa Maria Hospital, Pemalang, Indonesia. There are seven wastes in procurement drug process. Waste was found: over processing, overproduction, human potential, waiting, inventory, motion, transportation, that cause process cycle efficiency only 7.68%. The root cause of waste such as: poor communication, unplanned drug procurement budget, not appropriate inventory, organizing functions of pharmacy and therapeutics committee not yet run, structures of the work area is not adequate. The problem occurs on procurement process due to waste, include: communication, budget planning, inventory, Pharmacy and Therapeutics Committee (PTC) organizing and work area.

**Keywords:** drug procurement process, lean management, waste

## INTRODUCTION

With the application of Law No. 24 of 2011 of Badan Penyelenggara Jaminan Sosial (BPJS) on January 1, 2014 then all the people in Indonesia are required to be a BPJS participant.[1] The payment system used in BPJS is Indonesian-Based Case Groups (INA-CBGs) that a system of payments to health care providers are grouped based on the clinical characteristics and use of the same resources in the form of packets. Hospitals are required to act as efficient as possible. So that service costs do not exceed the fees paid by BPJS but still provide good quality to satisfy the patient. One of the methods to improve efficiency of service process in operations management is lean management, which approaches used to improve flow and eliminate waste that was developed by Toyota in Toyota way. Eiji Toyoda created the Toyota Production System (TPS) as form reflection of Toyota Way.

The essence of TPS is to eliminate waste.[2] Lean thinking focuses on value-added customer, any activity that does not add value is waste. If the waste is removed, then the customer receives more value-added services.[3] Value added criteria: if customer willing to pay for, change form or function of the product/service, right the first time.[4] There are 8 types of waste, including: overproduction, waiting, transportation, overprocessing, inventory, motion, defects, human potential.[5]

Lean management methods used in the hospital pharmacy and reap satisfactory results include: Cancer Treatment Centers of America (CTCA) at Midwestern Regional Medical Center (MRMC) Zion, Illinois, United States of America can reduce the turnaround time for the preparation of chemotherapy by 20%, and a decrease in the number of steps in the process by 50%; Elkhart General Hospital, Elkhart, Indiana, managed to cut the preparation time of intravenous drug about 90%, so it can distribute 2 clinical pharmacist for a full-time task, and saving cost about $1 million of operating expenses; Metro Health Hospital, Michigan managed to reduce the time of drug administration to patients by 33%, reducing the number of process steps from 14 to 9 by removing useless steps, decrease medication errors by 40%, and reduce annual costs for $153,000 of medical supplies; University of Minnesota Medical Center, successfully held an annual cost savings for $289,256, with a lean management approach to inpatient pharmacy; King Abdullah University Hospital, Jordan managed to hold more than 48% savings in cycle time inpatient pharmacy services.[6-10] According to the finance data of Santa Maria Hospital, Pemalang, the cost of drugs and medical consumables contribute approximately 40% of the total cost, so it requires adjustments to funding efficiently as possible.

Efficient service process closely related with the efficient management processes. Therefore, the problems that occur in drug management process must be addressed. To realize efficiencies in the process of drug management in pharmacy departement of Santa Maria hospital Pemalang it is necessary to know what are the things that interfere with the process management. One of the most problematic drugs management in pharmacy departement of Santa Maria hospital Pemalang is the procurement process. So that the formulation of the

problem in this research is what causes of waste in procurement drugs processes in the pharmacy departement of Santa Maria hospital Pemalang.

This study aims to identify the causes of waste in procurement drugs process in pharmacy department of Santa Maria hospital Pemalang using lean management approach.

## MATERIALS AND METHODS

This research design using case study research design with explanatory type, making data comes from several sources, i.e. the study of documents and archive footage, focus group discussions (FGD) and observation. The study was conducted at pharmacy departement of Santa Maria Hospital Pemalang with 17 persons sample size, consisting of a head of pharmacy, 1 procurement staff, 2 warehouse staff and 13 pharmacy staff. The sampling method by a non-probabilistic sampling with purposive sampling type. This research begins with observations on April 1 to 30, 2014 to describe the mapping process and issues surrounding procurement process. After mapping process described, then conducted FGD to seek waste and identify the cause by using the root cause analysis (RCA) 5 whys.

## RESULTS AND DISCUSSION

### Drugs Procurement Process Mapping

To make a more detailed mapping process may take a few times of observation, which can be used to create a swim lane diagram to show the roles and responsibilities of each staff, know where the switch roles or responsibilities and see the time it takes for each process or activities as shown in Figure 1 and value stream mapping to improve the usability of the mapping process by adding data such as: material, information flow, operational parameters and lead time is shown in Figure 2.[4,11,12]

### Waste Identification and Causes

According results of the analysis it is found that there are 7 kinds of waste, among other:

1. Waste over processing, there are problems:

a. Duplication of data compilation drug orders, the root cause of the problem because of separate location between the warehouse and procurement complicate monitoring and controlling each other.

b. Duplication of data compilation invoice for filing, the root cause for the problem because differences in reporting formats between warehouse and procurement cause they field under different organizational structure, one in pharmacy department and the other in finance departement.

2. Waste overproduction, there are problems:

a. Duplication of drug order data, root cause problem because there is no coordination or communication between the warehouse and procurement to remind each other.

b. Duplication of invoice data to the archive, the root cause of the problem because differences in reporting formats between warehouse and procurement.

3. Waste human potential, there are problems: head of pharmacy makes proposal of drug order, the root cause of the problem because drug orders did not notice minimum inventory.

4. Waste waiting, there are problems:

a. Making mail order drug waited for 1 day, because there is no drug procurement budget planning

b. Entering drug data entry waited 1 day, due to less number drug orders or supplier schedule delivery time is less appropriate

c. Drug lead time extending, because there is no supervision from the supplier

5. Waste inventory, there are problems: slow moving drug expired before used, the root cause of the problem because Pharmacy and Therapeutics Committee (PTC) not carry out their functions properly

6. Waste motion, there are problems: the warehouse staff ordered other staff to get drugs, the root cause of the problem because there is no spatial planning in warehouse.

7. Waste transportation, there are problems: there are some drug that are kept separate from the warehouse, the root cause of the problem because the space around the pharmacy is already in use

Waste over processing and waste overproduction have two same root cause of the problem, because waste overproduction is the result of waste over processing, waste waiting also have the same root cause, include: the separate location between warehouse staff and procurement staff, no budget planning of drug procurement.

Separated location between warehouse and procurement staff cause communication between each other is not running well, besides that information system has not been integrated that also led to different inventory data between procurement and pharmaceutical warehouse, so that reliable data is only data on the card stock. So far there has been no settlement to resolve these problems, so that drug stocks are often empty due to late ordering. To overcome this, should be used other card substitute for stock card that should not be taken out too long. In visual management, a term known *kanban*, a method for regulating the supply and inventory, translated as a signal or card, *kanban* cards can be inserted in a pile of drugs on the amount of the minimum inventory drug, so that when the card is visible it's time to order drug. *Kanban* cards

are labeled such information as drug name, ordered amount and supplier name[4].

The absence of drug procurement budget planning caused the cost of drug procurement very volatile and unpredictable so that the finance departement difficulties to manage cash flow. This happens because the drug needs changing, which is triggered if the prescribing physician arbitrary. Initially drug often prescribed suddenly stopped and switched to another drug, so there are drug that accumulate and instead there is an empty drug stocks. In addition, drug order did not notice minimum inventory and administration time of making mail order drug. To overcome this, pharmacy has been trying to make data drug needs for 1 week partially and drugs lead time but the drug administration time of letter orders is difficult to know certainly. According to Kapoor and Mullen, with the implementation of the system just in time (JIT), then the safety stock can be reduced and an increase in the stability of the stock through the reduction of the bullwhip effect. According to Shen, inventory manage effectively to reduce costs.[13,14] To achieve this goal it is necessary to make policy regarding drug selection, determining minimum inventory, drug lead time data, shortening the administration time of making mail order drug. According to Granko, procurement staff needs to establish a good relationship with the supplier in order to monitor the price, ensure the delivery of products, optimize discounts and take advantage of value-added services.[15]

Waste human potential has a root similar problem with waste above, the ordering does not notice drug minimum inventory. This problem can be overcome by using *kanban* cards and same archival data generation between warehouse and procurement. In inventory management, patient as consumers really take role. According to McNair, the creation of customer value can help shape the activities that focus on sustainable profit growth.[16]

Waste waiting have root problems associated with the supplier. According to research conducted by Kanyoma, through a questionnaire distributed to 34 hospital managers and procurement managers at five health centers in Southern Malawi found that 76.5% of respondents approve a single supplier as one of the causes of drug stock void, otherwise it delays ordering drug by procurement staff also be other reasons approved by 50% of respondents.[17] Waste is also due no supervision by the supplier.

The root of the problem of waste inventory because PTC not perform their function well, because most of the members consist of part-time medical staff, they are busy working elsewhere so less focus on organizing functions in PTC. The impact, the proposed drug medical staff were never convened and all proposals approved, resulting in increased drug items. The efforts that have been done by director act to decide whether the drug can be held or not, but this is not communicated with medical staff so that the information about a new drug known to medical staff who propose and its prescription only depend on that medical staff. According to Tyler, PTC responsible for management of formulary systems, drug use evaluation, reporting and monitoring of drug side effects, prevention of medication errors and the development of guidelines for clinical care plans.[18] In addition, PTC also served to increase the knowledge of the medical staff of drug therapy, drug therapy safety, and improve therapeutic outcomes.

Waste motion and transportation have the same roots problem, because there is no spatial planning, so that some drug which are placed in another location then prone to damage and loss. In lean management, structured system to organize work areas and certain standards in order to increase the productivity of labor called 5S, its acronym in English sorting, storage, shining, standardize, self discipline, stands in Japanese *seiri, seiton, seiso, seiketsu, shitsuke*.[4] According to McDowell and Huang, facility layout design techniques implemented in the hospital pharmacy should use a step-by-step design process, by observing and analyzing the current situation, observe the space available at this time, making the process flow diagram activity pharmacy, making the material relationship chart to detail in the pharmaceutical area are related to each other and how the relationship linkages, researching other applications in the pharmaceutical or useful in scientific work, measuring the availability of space in the pharmacy, to develop a preliminary design sets, as well as modify the initial design so that the design can be received by the pharmacy staff.[19] When depicted in the mapping process, waste in the swim lane diagram is shown in Figure 2 and value stream mapping in Figure 3.

Based on mapping the value stream process, it can be found that the value added time in the procurement process only 600 minutes (7.68%) of the drug procurement process cycle time. According to the survey of George group consultant on more than 100 companies, including hospitals in transactional business processes, the process cycle efficiency at least 10%.[20]

When waste can be eliminated, the procurement process can be more efficient. Elimination of waste can performed, include eliminating the process of making the proposed drug orders, with elimination this process the activity of collecting and checks card stock is also removed and replaced with collecting *kanban* card, then immediately given to the procurement staff; eliminate the process of making invoice records copy in the warehouse pharmacy; calculate the number of minimal stock; activate the function of PTC organization; set a budget planning for the procurement drug; made cooperation agreement with the supplier; and conduct the process of work area. The mapping process is described in the proposed upcoming swim lane diagram in Figure 3 and value stream mapping in Figure 4. With the elimination of waste then the process cycle efficiency can be increased from 7.68% to 14.42%.

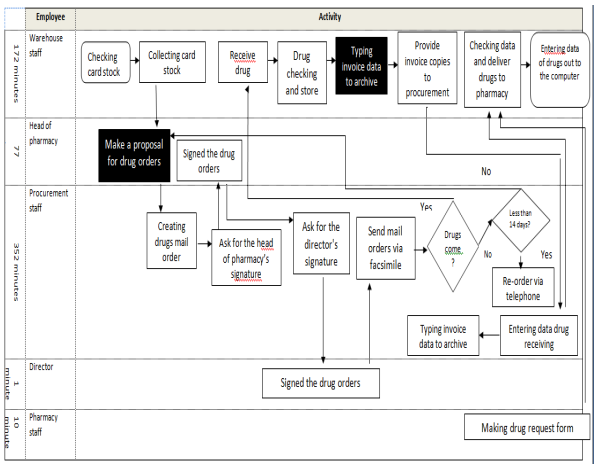


**Figure 1:** Swim Lane Diagram Drug Procurement Waste

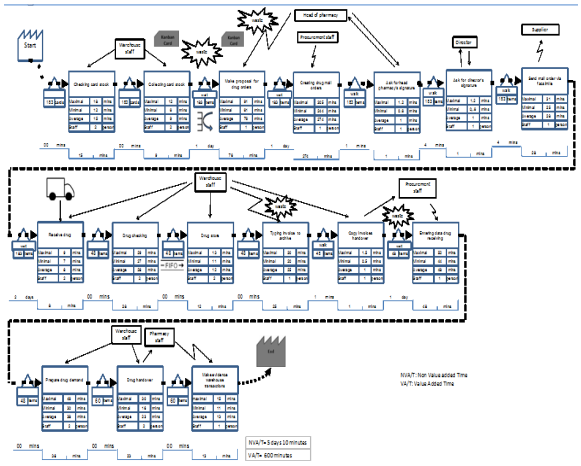

**Figure 2:** Value Stream Mapping Drugs Procurement Waste

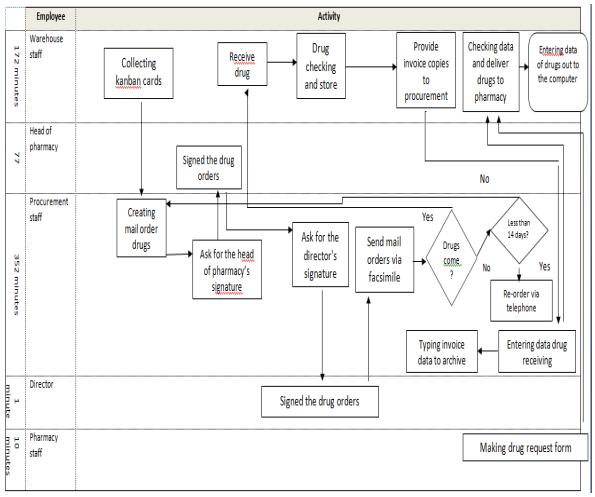


**Figure 3:** Upcoming Swim Lane Diagram Drug Procurement

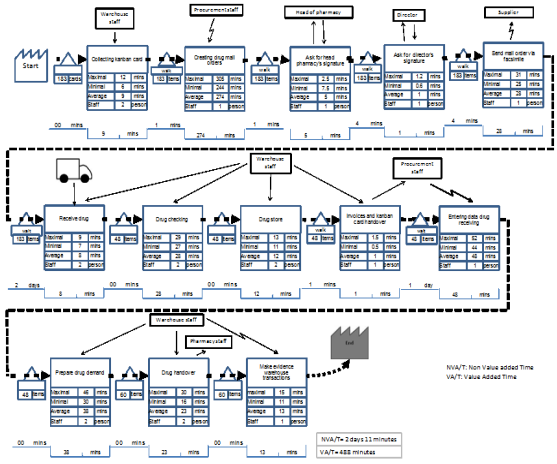

**Figure 4:** Upcoming Value Stream Mapping Drugs Procurement

## CONCLUSION

In procurement process, there were 7 kinds of waste with root causes such as: poor communication between warehouse staff and procurement staff, drug procurement costs affect cash flow, ordering drugs do not notice minimum inventory, less communication with suppliers, PTC organizing function is not running well, and the arrangement of work area is not adequate.

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**Source of Support:** Nil, **Conflict of Interest:** None.