



The Inventory Control of Disposable Medical Materials in The Inpatient Installation of X Private Hospital in Central Java

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<p>Track Record Article</p> <p>Accepted: 4 April 2023 Revised: 12 May 2023 Published: 15 June 2023</p> <p>How to cite: Karimah, R., Suryawati, C., & Arso, Pawelas, S. (2023). The Inventory Control of Disposable Medical Materials in The Inpatient Installation of X Private Hospital in Central Java. <i>Contagion: Scientific Periodical Journal of Public Health and Coastal Health</i>, 5(2), 560–573.</p>	<p style="text-align: center;">Abstract</p> <p><i>The hospital pharmacy is one of revenue center, besides 50% of all income derived from hospital management pharmaceutical supplies..The implementation of the inventory control the disposable material in hospitals is still done manually without any method of special calculations. The purpose of this study is to analyze the inventory control of disposable medical materials in the inpatient installation of X private Hospital, in Central Java. This research is the qualitative study with those great case study aimed to locate and understand what is behind the phenomenon. This research was conducted at X Hospital in Central Java from August to December 2022. The sample of this research is 8 informants. Collecting data in this study with in-depth interviews. Analysis of the research data is data reduction, data presentation and drawing conclusions. The results of the study did not find any special calculation method and still found accumulation of disposable materials in several inpatient wards. The obstacle that most contributed to hindering the planning process was the absence of average usage data in one month because there was no reporting from the user. Therefore, it can be concluded that the availability control at X Private Hospital in Central Java is not in accordance with the guidelines issued by the Ministry of Health. it is suggested to the hospital to create a recording and reporting system regarding the use of consumable medical materials and it is necessary to have standard operating procedures and policies for the use of consumable medical materials in inpatient wards so that effective and efficient availability control can be carried out.</i></p> <p>Keyword: <i>Disposable Medical Materials, Inventory Control, Logistics Management, Pharmaceutical Installation</i></p>
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INTRODUCTION

Every human being has human rights, one of which is the right to health. Health is one of the elements of welfare that must be realized in accordance with the ideals of the Indonesian nation as referred to in Pancasila and the 1945 Constitution of the Republic of Indonesia. Based on Law Number 36 of 2009 concerning Health, everyone has the right to obtain safe health services. , quality, and affordable. Regulation of the Minister of Health of the Republic of Indonesia Number 4 of 2018 concerning Hospital Obligations and Patient Obligations, defines a hospital as an institution that provides overall individual health services by providing inpatient, outpatient and emergency services. In administering hospital services listed in Law Number 44 of 2009 concerning Hospitals, there are several requirements that must be met, namely building requirements, infrastructure, human resources, pharmacy, and equipment.

Pharmaceutical services carried out by hospitals based on Article 1 number 3 of the Minister of Health Regulation Number 58 of 2014 concerning Pharmaceutical Service Standards in Hospitals are direct and responsible services to patients related to pharmaceutical supplies with the aim of achieving definite results to improve quality of life patient.

Based on the 2019 Republic of Indonesia Ministry of Health Regulation, pharmaceutical services in hospitals must ensure the availability of safe, quality, useful and affordable pharmaceutical supplies, medical devices and medical consumables which are carried out by the Hospital Pharmacy Installation. The Hospital Pharmacy Installation is one of the revenue centers because more than 90% of health services carried out in hospitals use pharmaceutical supplies such as medicines, consumable medical devices, chemicals, radiology materials, medical devices, and medical gases. In addition, 50% of all hospital revenue comes from managing pharmaceutical supplies. Pharmaceutical installations contribute as the largest source of revenue for hospitals; if pharmaceutical supplies are not managed carefully and responsibly, the hospital's income will decrease (Kemenkes RI, 2019). Pharmacy Installation has an important role in the hospital (Astuti et al., 2023).

The management of pharmaceutical supplies in hospitals consists of a series of cycles or stages starting from selection, planning, procurement, receipt, storage, distribution, destruction and withdrawal, control, also administration (Kemenkes RI, 2014). The control stage is carried out to maintain the type and amount of supplies according to service needs, through setting up an order or procurement system, storage, and expenditure. This aims to avoid excess, shortage, unavailability, damage, expiration, loss, and the return of orders. The control stage consists of controlling inventory, which aims to avoid unavailability or shortages of pharmaceutical supplies; controlling usage, which aims to determine the amount of receipt and use of pharmaceutical supplies so as to ensure the amount of pharmaceutical supplies needed in one period; and handling when damage occurs (Kemenkes RI, 2019).

The procurement of pharmaceutical supplies in the form of drugs and consumables represents a large portion of the costs in the health industry, particularly hospitals. The provision of quality pharmaceutical supplies is very important in supporting health services in hospitals, and this activity cannot be separated from the hospital supply management. Proper pharmaceutical supply management is essential to ensure the availability of adequate drugs and consumables for health services to patients and as a source of income for hospitals (Dewi et al., 2020). In inventory control, there are various methods that can be used, namely: inventory control with the ABC method, inventory control with economic order quantity (EOQ) analysis, inventory control with reorder point (ROP) analysis, inventory control with safety stock (SS)

analysis, and inventory control with analysis of turn over ratio (TOR) (Kencana, 2016; Listyorini, 2016).

Based on research Lolo et al., (2020) stated that the problem of ineffective drug management included drug shortages, purchases from outside pharmacies, and unplanned purchases. Through this ABC Critical Index analysis, it is hoped that there will be improvements in the planning and procurement of antibiotic drugs at the Manado Adventist Hospital so that funds are used efficiently and optimal therapeutic results are obtained for patients. Another study by Yudianti et al., (2021) on Inventory Control of Disposable Medical Materials at the Bali Mandara Eye Hospital found that there was a decrease in total inventory costs of 19.14% after the application of the EOQ method. The application of the Reorder Point (ROP) method can anticipate stockouts or unavailability

X Private Hospital in Central Java has 25 types of services, one of which is inpatient care. The implementation of health services at the X Private Hospital in Central Java is surely inseparable from the pharmaceutical supplies, one of which is medical consumables. It is medical devices intended for single-use, in which the product list is regulated by laws and regulations. Medical Consumables management in X Private Hospital in Central Java , is divided into Medical Consumables which are listed in the prescription and Medical Consumables that are not listed in the prescription. Based on the results of interviews with the pharmacy installation staff and through observation, it is found that the inpatient installation is the most wasteful installation in the use of Medical Consumables. Medical Consumables inventory control at X Private Hospital in Central Java is carried out manually by the pharmacy installation with no calculations in accordance the theory. As a result, there is a lot of accumulation of Medical Consumables supplies in several wards. The accumulation of Medical Consumables will cause the capital retained and increase the storage costs; therefore, it is necessary to control the pharmaceutical supplies by considering the available costs and budget. Based on the problems described above, the researcher intended to conduct a further research related to controlling the inventory of medical consumables in the pharmacy installation at X Private Hospital in Central Java. In this study, researcher conducted in-depth interviews with parties related to Medical Consumables inventory control. The advantage of this research article is that after the stages which are not in accordance with the applicable theory and obstacles are identified, they will be explored during the planning process using in-depth interviews.

The purpose of this study is to analyze the inventory control of disposable medical materials in the inpatient installation of X private Hospital in Central Java.

METHODS

This research is a qualitative research with a case study approach that aims to find and understand what is hidden behind phenomena which are sometimes difficult to understand by exploring a case in depth, collecting complete information using various data collection procedures based on a predetermined time. This case can be an event, activity, process, and program (Sugiyono, 2017). This research was conducted at X Hospital in Central Java from August to December 2022.

Qualitative data were obtained using in-depth interviews with the aim of obtaining information that researchers could not obtain from observations during the planning process, by asking questions to informants/ research subjects whose criteria have been selected by purposive sampling by researchers. The informants of this study consisted of 3 main informants and 5 triangulation informants. The main informants in this study were 3 pharmacists who were involved in the inventory control, while the triangulation informants were 2 Heads of Inpatient Wards, 1 assistant of nurse and 2 people from the financial side of X Private Hospital in Central Java. Analysis of the research data is data reduction, data presentation and drawing conclusions.

RESULTS

Based on the results of observations made by researchers in the inpatient ward, it was found a buildup of medical consumable materials, these observations were made at the end of the month before planning for the next month. The buildup of medical consumable materials was due to the absence of inventory control which resulted in overstock. Therefore, the discussions aspect in this study was carried out to provide a complete description regarding the implementation of inventory control in the inpatient installation of X Private Hospital in Central Java. Implementation of inventory control consists of:

Characteristics of Informants

From Table 1. showed the majority of the informants in this study were female, The research informants consisted of 3 main informants, namely (Head of Pharmacy Warehouse, Former Head of Pharmacy Installation, Head of Pharmacy Installation) and 5 triangulation informants consisting of (Head of Inpatient Installation, Head of Inpatient Installation, Nurse Assistant, Financial Staff and Head of Finance). Which can be seen in the table below:

Tabel 1. Characteristics of Informants

Positions	Informant	Gender
Head of Pharmacy Warehouse	Main informant 1	Male
Ex-Head of Pharmacy Installation	Main informant 2	Female
Head of Pharmacy Installation	Main informant 3	Female
Head of the Inpatient Ward	Triangulations informant 1	Female
Head of the Inpatient Ward	Triangulations informant 2	Female
Assistant Of Nurse	Triangulations informant 3	Female
Financial Staff	Triangulation informant 4	Female
Head of Financial	Triangulation informant 5	Male

Policies and Guidelines

Policy or Standard Operational Procedure (SOP) is a written document that regulates a work procedure that is constant and unchanged. For the inventory control, the X private hospital in Central Java already has documents such as: 1) National Formulary; 2) Hospital Formulary; 3) Cooperation agreements with drug suppliers; 4) Supply mechanisms to anticipate stockouts, such as cooperation with third parties and procedures for providing substitution advice to prescribing doctors; 5) System of drugs monitoring, using and securing; 6) Pharmaceutical service guidelines; and 7) Guidelines for drug procurement.

Besides the policies, in controlling the inventory, X Private Hospital in Central Java has applied SOP that is in accordance with guidelines from the Ministry of Health, namely: 1) SOP for handling drug stock unavailability 2) SOP for monitoring new drugs and unwanted events which are not anticipated; 3) SOP for security system or protection against loss or theft. 4) The SOP for obtaining drugs when the pharmacy is closed or out of working hours; 5) The SOP to overcome drug stockouts, and 6) SOP for the fulfillment of drugs which are never available.

“.....we already had the SOP according to the Ministry of Health, also the guideline too..”

(Main Informant 2, Ex-Head of Pharmacy Installation)

While the implementation of inventory control in the inpatient ward, until now there is no written policy or SOP that applies, until now if the use of medical consumable is felt to be wasteful, there will be a warning to be more economical in using it.

“...When it is felt to be wasteful, I'll directed to be more efficient in using fixomul and hand scoons...” (Triangulations Informant 1, head of inpatient wards)

“there are no policies or SOP regarding inventory control here...” (Triangulations Informants 2, head of inpatient wards)

Implementation of Inventory Control

Inventory Control is a system that aims to keep pharmaceutical supplies available. The implementation of inventory control is still carried out manually by the hospital pharmacy installation by routinely checking the stock in hospital management information system and the real stock to avoid stockouts. Besides that, the hospital pharmacy installation take some actions to avoid medical consumables stockouts. When the remaining medical consumables stock is very low in the middle of the month, planning and ordering will be carried out again,

“...when the nurse was shopping we see the remaining stock, if there's still enough, there's no problem, but when there's only a little left, the admin will make a report, then look at the resume that's been made for the next order, the control is every day, every time when the nurse was shopping, the admin also checking the available stock...” (Main Informants 1, Head of Warehouse Pharmacy)

The implementation of the inventory control until now there has been no theoretical calculation.

“...there is no calculation for the inventory control, the calculation only for planning using excel...” (Main Informant 3, Head of Pharmacy Installation)

“... there is no inventory control, because there is no available data...” (Triangulation Informants 4, Financial Staff)

In addition to the hospital pharmacy installation, inventory control is also carried out manually, both by the user and by the finance department. If the use of a mask exceeds the maximum limit for each individual, the individual is required to buy by themself, while for handscoon there is no inventory control because handscoon is included in the prescription, while for fixomul until now there has been no inventory control.

“...no inventory control for fixomul. We have limited the use of fixomul only 2 packs a days, but still less, because its depending on the patient's condition and the needs of the patient...” (Triangulation informan 1, Head of inpatient wards)

“...for handsoons is included in the prescription, for mask we alloted each individu, if the mask is run out they should buy for themselves...” (Triangulation informant 1, head of inpatient wards)

While the inventory control which is carried out by the finance department is to routinely check the remaining stock that comes from the hospital pharmacy installation report; later, the finance department will input the remaining stock and it will be seen in the financial balance sheet.

“...pharmacy will sent a report to finance, and I'll input the remaining stock and it will be seen in the financial balance sheet, sometimes I ask to check the stock opname/ current stock...” (Triangulations Informant 5, Head of Finance)

Data's of Inventory Control

For the inventory control, the available data such as : requirement book, price sticker, stock card, and computerization

“.. we have book of needs that contains records when devices or drugs are at the minimum stock and need to be ordered and recorded by the warehouse admin, we already have sticker that containing the expiration date of medical consumable materials and drugs...” (Main Information 3, Head of Pharmacy Installation)

“...also me and the admin are always updating the stock card, the stock card is always updated every incoming and outgoing item, I also input in hospital management information system every incoming and outgoing items...” (Main information 1, head of warehouse pharmacy)

Data that not available yet according to the Ministry of Health's guidelines are minimum and maximum stock calculation, the calculation is not carried out because there is not enough data to do the calculation

“...we don't do the calculation, because there is is no real average usage data in one month...” (Main informationt 1, Head of warehouse pharmacy)

Evaluation of Inventory Control

Evaluation of inventory control is an activity that aims to ensure the availability and affordability of pharmaceutical supplies. The Hospital Pharmacy Installation of X Private Hospital in Central Java did not carry out an evaluation, this was because there was no calculation method used to inventory control, so no evaluation was carried out.

“..there is no evaluation of inventory control here..” (Main Information 1, Head of Pharmacy Installation)

“...There's no calculation here, there's no evaluation so far...” (Main Information 2, Ex-Head of Pharmacy Installation)

DISCUSSION

Inventory control is an activity to ensure the achievement of the desired goals which are in accordance with the decided strategies and programs so that there is no excess or shortage of medical consumables in the hospital. A good pharmaceutical supply is when its availability is in an optimal amount—not less than the safety stock and not more than three times of monthly usage. Controlling the pharmaceutical supplies aims to create a balance between supply and demand in order to realize the effective and efficient health services (Yudianti et al., 2021). Good inventory management will be able to increase the hospital revenue while ensuring the quality of health services for patients.

Policies and Guidelines

Policy or Standard Operational Procedure is a written document that regulates a work procedure that is constant and unchanged. The Standard Operating Procedure or procedure is used as a guideline in the drug logistics management process with the aim of achieving good drug logistics management (Tonis et al., 2021).

In the implementation of pharmaceutical logistics management, there are policies that applied in controlling inventory, each hospital needs to prepare several documents: 1) National Formulary 2) Hospital Formulary 3) Cooperation agreements with drug suppliers. 4) Supply mechanisms to anticipate stockouts, such as cooperation with third parties and procedures for providing substitution advice to prescribing doctors. 5) System of drugs monitoring, using and securing, 6) Pharmaceutical service guidelines, and 7) Guidelines for drug procurement. Based on the observation and document review, X Private Hospital in Central Java already has these documents. Besides the policies, in controlling the inventory, X Private Hospital in Central Java has applied,

Standard Operational Procedure

That is in accordance with guidelines from the Ministry of Health, namely: 1)SOP for handling drug stock unavailability; 2)Standard Operational Procedure for monitoring new drugs and unwanted events which are not anticipated; 3)Standard Operational Procedure for security system or protection against loss or theft. 4)The Standard Operational Procedure for obtaining drugs when the pharmacy is closed or out of working hours; 5)The Standard

Operational Procedure to overcome drug stockouts, and 6) Standard Operational Procedure for the fulfillment of drugs which are never available.

In the implementation of pharmaceutical activities, especially logistics management, there must be policies prevail to avoid violations or unwanted things, as well as guidelines for carrying out logistics management in hospitals (Kencana, 2016).

Implementation of Inventory Control

Inventory control is an activity to ensure the achievement of the desired goals in accordance with the strategies and programs that have been set so that there are no shortages or empty excesses and pharmaceutical preparations (Baybo et al., 2022). Planning has important role to successful implementation, while monitoring and evaluation can encourage the team to implement recommendations (Mariani et al., 2023).

The implementation of inventory control is still carried out manually by the hospital pharmacy installation by routinely checking the stock in hospital management information system and the real stock to avoid stockouts. Besides that, the hospital pharmacy installation take some actions to avoid medical consumables stockouts. When the remaining medical consumables stock is very low in the middle of the month, planning will be carried out again, and when the stock is running low towards the end of the month, the order is made with an amount that is deemed sufficient until the end of the month. Currently, there is no theoretical calculation regarding the inventory control. There is no calculation due to the incomplete data available to perform the calculation, so the hospital pharmacy installation has not performed calculations for inventory control. In addition to the hospital pharmacy installation, inventory control is also carried out manually, both by the user and by the finance department. The user will receive a warning from the head of the room when it is felt to be wasteful, and there is no reporting on the use of medical consumables. The user has not provided average usage data in one month so that the hospital pharmacy installation cannot perform calculations using methods in accordance with the theory, while the inventory control which is carried out by the finance department is to routinely check the remaining stock that comes from the hospital pharmacy installation report; later, the finance department will input the remaining stock and it will be seen in the financial balance sheet. The problem that is often encountered in controlling inventory is how to strike a balance between inventory management and the costs it incurs (Satibi et al., 2020). The budget for drugs and medical consumables in hospitals is the largest component of hospital expenditures. In many developing countries, expenditure on drugs and medical consumables in hospitals accounts for about 40% to 50% of the total hospital

budget. This large budget must be managed effectively and efficiently to meet the health needs of patients (Kemenkes RI, 2019).

According to Satibi et al., (2020), in controlling inventory sistem here are four methods, namely: VEN (Vital Esensial and Nonesnsial), EOQ (Economic Order Quantity), ABC (Always Better Control) and JIT (Just in Time). In the implementation of inventory control, it is necessary to have a calculation method with the aim of to achieve effective and efficient inventory control. Too much inventory of drugs and pharmaceutical supplies will require space and large storage costs, and the stored supplies will cause the capital circulation stops. Meanwhile, if it is too little, there is a possibility that there will be services that are not served because the inventory experiences a stockout, resulting in a decline in the quality of hospital services, especially pharmacy installations (Indarti et al., 2019).

Inventory Control Data

Inventory control through stock cards for each drug is an activity of recording the amount of incoming drugs when the warehouse receives drugs from the city pharmacy warehouse and records the outgoing drugs when there is a request from the pharmacy. Control activities are carried out every day. In addition, drug inventory control using a stock taking reporting system is carried out every 2 times a year (Baybo et al., 2022)

The hospital pharmacy installation of X Private Hospital in Central Java has several documents which are suitable for control. The installation of the X Private Hospital has a book of needs that contains records when devices or drugs are at the minimum stock and need to be ordered. The book is recorded by the warehouse admin, and the results are reported to the head of the warehouse. In hospital pharmacy installation of the X Private Hospital, the book of needs is known as defecta. As for the price stickers, based on the observation result, there are price stickers on drug supply and medical consumables which contain the invoice date of an item.

The hospital pharmacy installation of X Private Hospital does not perform control calculations using the maximum-minimum method because there is no data available for calculation. In implementing the maximum and minimum methods, calculations need to be carried out by requiring data on average usage in one month, lead time, and safety stock. In the case of X Private Hospital, the data of average usage in one month is unavailable due to the absence of reporting from the user. Since the user has only shopped without providing the report of the real usage, the report from user cannot be used as a basis for the average usage data every month. Besides that, the safety stock data also cannot be provided since the calculation of safety stock requires average usage every month as well. The non-

implementation of minimum and maximum stock calculations causes in stock accumulation in several inpatient wards; this is in accordance with Indarti's research (2019), that the minimum-maximum stock level calculation has a positive impact on the efficiency of drug inventory, it is a decrease in inventory value and ITOR (Inventory Turn Over Ratio) value as expected, and the application of the minimum-maximum stock level method has an effect on the effectiveness of drug inventory, it is a decrease in the number of stockouts (Indarti et al., 2019).

X Private Hospital in Central Java has an updated stock card; there is a warehouse master stock card to record the supplies circulation in the warehouse; in addition, there is a compounding stock card that contains a record of the entry and exit of drugs and goods in the compounding and service rooms; a drug marking card containing the expiration date of goods and drugs; and an inventory card or fixed asset card to monitor all hospital pharmacy installation inventory items which are fixed assets. The stock card must be updated continuously. The main function of the stock card is to record the drug mutations from receipt, loss, damage, expiration, to expenditure. The data in the stock card is used to compile reports, make procurement plans, and prevent leaks or losses due to poor stock management (Ghozali et al., 2021).

This Hospital Management Information System is a form of Hospital Management Information System which contains data regarding prescription recording and reporting; quantity, type, expiry date, price of pharmaceutical preparations and medical devices (San et al., 2020). X Private Hospital in Central Java has had Hospital Management Information System since 2021. The implementation of Hospital Management Information System in X Private Hospital is running well. The warehouse can monitor the remaining stock by using Hospital Management Information System, which will be compared with the real stock, and every time there is a transaction in the warehouse, the warehouse always updates Hospital Management Information System. The finance department also always monitors the remaining stock from Hospital Management Information System, which will later be displayed in the balance sheet. But, Hospital Management Information System has not been used optimally by the user.

The user still does not input the use of medical consumables orderly. System, information, and service quality simultaneously have a positive influence on system usage, which as a whole provides individual benefits for pharmacy installation staff and organizational benefits for pharmacy installations in providing fast, precise, and safe (Sumriati et al., 2022). Similarly, the management and development of the Hospital Information System provides convenience in accessing integrated systems (Tangkuman et al., 2019). The inhibiting factors

in the utilization of Hospital Management Information System are server problems and application incompatibility, as well as the lack of Hospital Management Information System knowledge skills by hospital human resources (Molly et al., 2021).

Inventory Control Evaluation

Evaluation of inventory control is an activity that aims to ensure the availability and affordability of pharmaceutical supplies and medical consumables that are efficient, effective, and rational (Kemenkes RI, 2016). The stock of medical consumables is considered good when the inventory of medical consumables is at the optimal level, not less than the safety stock or more than three times of the monthly usage. The excessive stock has negative impacts such as increased expiration of medical consumables, lost opportunities, as well as revenue. Shortage conditions not only cause a decrease in revenue but also contribute to higher mortality and morbidity in patients in critical conditions. Lost opportunities and revenue occur in a stagnant state as inventory, ordering, and handling costs increase (EISSAa et al., 2020;Minken et al., 2019).

Good drug supplies are drug supplies that are at optimal levels, minimum safety stock and are used no more than three times a month (Dyatmika et al., 2018). The purpose of pharmaceutical inventory control is to create a balance between supply and demand also to realize the effective and efficient health services. Good inventory management can increase hospital revenue while maintaining the quality of health services for patients (Yudianti et al., 2021).

The hospital pharmacy installation of X Private Hospital in Central Java has not performed the inventory control evaluation yet since the calculation method has not been done in the inventory control. The evaluation needs to be done because it is carried out to analyze the final results and achievements of the entire logistics management process. The analysis can be a basis of decision making for the next logistics management. In addition, the evaluation aims to ensure optimal inventory of drugs and medical consumables in terms of quality, type, quantity, time, and rational usage. By implementing the inventory control and evaluation, the available funds are expected to be used as effectively as possible for health services (WHO, 2017).

CONCLUSIONS

The implementation of inventory control in X Private Hospital in Central Java is still being carried out manually both from pharmaceutical installation, users and finances, there is no

calculation using methods in inventory control. The calculation was not carried out because there was no available data on average usage in a month due to the absence of reporting from the user, the unavailability of this data resulted in no calculations or evaluation in controlling availability, this resulted in the discovery of several accumulations stock of medical disposable materials in several inpatient wards.

It is suggested to the hospital that it is necessary to report from the user regarding the use of consumable medical materials which can later be used to calculate availability according to theory. there needs to be communication between the head of the hospital pharmacy installation and management to develop a written policy regarding the implementation of availability control to avoid violations and as a guide in carrying out logistics management and there is a need for standard operating procedures and policies in the use of consumable medical materials in inpatient wards so that effective and efficient availability control can be carried out

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