

## Analysis Of Medical Health Equipment Treatment At Royal Prima Medan General Hospital

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### **Abstract.**

*Medical devices are one of the factors that play an important role in providing health services to the community. Sustainable health services need to be supported by equipment that is always in a ready-to-use condition and can function properly. The level of public health needs to be improved through quality health services, one of which is through the provision of good, safe and suitable medical devices. So that medical equipment is always in good condition, safe, and suitable for use, it is necessary to carry out preventive maintenance including periodic maintenance and implementation of tests and calibrations. The purpose of this study was to analyze the Treatment of Medical Medical Devices at Royal Prima Hospital Medan. The results of this study indicate that the number of human resources in carrying out medical device maintenance at Royal Prima Hospital Medan is maximized, the exact amount of funds for the maintenance of medical devices at Royal Prima Hospital Medan is unknown, but each device already has its own budget in terms of treatment. and repairs, the placement of medical devices, especially in the ICU and IGD rooms, is in accordance with SOPs, it can be seen that their placement is regular and easy to reach by health workers such as doctors and nurses, the maintenance of medical devices is routinely carried out as well as once a week technicians always carry out maintenance on medical devices, supervision has also been carried out optimally by technicians if there are medical devices that are constrained in their operation.*

**Keywords:** Treatment, Medical Medical Devices, Maintenance.

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### **I. INTRODUCTION**

Hospital is a health service facility organized by the government and the private sector. Hospital is a health service institution that provides complete individual health services that provide inpatient, outpatient, and emergency services (PERMENKES R1 NO 4, 2018). At the hospital, the health services provided are in the form of outpatient, inpatient, and emergency services which include medical services. The need for health for various activities is growing from time to time. This is one of the markers of today's health needs that will be higher and more sought after by every human being. Many hospitals have been opened with new and varied facilities that are very different both in terms of service and technology. Therefore, a proper planning process is needed, especially planning for the maintenance of medical equipment and facilities because it has an important influence on service quality. Hospitals follow the development of medical device technology because it is one of the factors that play an important role in health services to patients and the availability of ready-to-use and tested medical devices is a necessity (Listiyono, 2020). Equipment and facility maintenance planning is a matter that must be given attention because it will facilitate the decision-making of maintenance and maintenance teams to increase their knowledge, increase the effectiveness of maintenance actions, and plan and program further maintenance efficiently.

The difficulties faced by hospitals according to Hassan's research (2020) are that there are still several difficulties such as inadequate and old equipment, lack of proper sterilization, lack of proper leadership workload, no quality check of equipment, no teaching program, and inaccuracies. Inappropriate staff time, timing, and organization in the operating room. Royal Prima Hospital Medan is one of the largest private hospitals and will become a referral center for the community, especially the city of Medan and the people of North Sumatera in general. Royal Prima Hospital Medan certainly has a lot of equipment that supports its operations, in which the assets or equipment require special handling so that they continue to provide excellent service for patients. Each ward has equipment that supports the service process for patients, but due to lack of equipment maintenance, sometimes when you want to use the equipment, it cannot be used so you have to borrow from another ward or have to wait for a technician. This results in less speed in

serving patients, for example, heart recording devices, blood pressure meters, ventilators, hemodialysis, and others. Maintenance of equipment so that it is ready to use and in a well-maintained condition. Based on this background, it is necessary to analyze the efforts that have been made and what will be done by the management of Royal Prima Hospital Medan in making a program for maintaining medical operational assets. With the formulation of the problem regarding the asset maintenance system that has not been running well.

## II. LITERATURE REVIEW

### 2.1. Hospital

The hospital is a unique and complex organizational form and has special characteristics and functions because in it there are various kinds of professions involved in producing medical service products. provide health services (Bunga, 2019). The definition of a hospital according to the Regulation of the Minister of Health of the Republic of Indonesia Number 3 of 2020 concerning Hospital Classification and Licensing, Hospital is a health service institution that provides complete individual health services that provide inpatient, outpatient, and emergency services. Based on the types of services provided, hospitals are categorized into two types, namely general hospitals that provide health services in all fields and types of diseases and special hospitals that provide primary services in one field or one particular type of disease based on disciplines, age groups, organs. , type of disease, or other specificities.

### 2.2. Asset

Assets or assets are economic resources that are expected to provide business benefits in the future (Yudistria, 2017). Fixed Assets or also commonly referred to as Fixed Assets are assets or resources of a business entity obtained and controlled from the results of past economic activities (transactions). fixed assets are used in carrying out business operations of business entities to produce goods or services in producing goods and services, the role of fixed assets is very significant. PSAK stipulates that fixed assets are tangible assets that are acquired/acquired in a ready-to-use condition or built beforehand and used in the operating activities of a business entity, not intended for resale in the framework of the company's normal activities, and have economic benefits for more than one financial year (more than one period). The primary criterion for an asset is the future economic benefits embodied in the asset, i.e. the potential to contribute, directly or indirectly, to the flow of cash or cash equivalents to the entity. This potential can be productive and can generate cash or cash equivalents or it can reduce cash outlays or lower costs.

### 2.3. Medical Asset

Medical devices are tools that are goods, apparatus, or instruments with each component array of parts produced and sold for maintenance, care, diagnosis, prevention, mitigation, and healing of any symptoms of health disorders that occur in the human body (Ramadhani, 2018). Management of medical devices also requires the existence of reliable implementers in operating, maintaining, and repairing to ensure that medical devices function properly (Listiyono, 2020). Health equipment is one of the factors that play an important role in providing health services to the community. Sustainable health services need to be supported by equipment that is always in a ready-to-use condition and can function properly (Veni, 2020). The challenge that must be faced by a hospital is how to optimize the use of health equipment that is as efficient and effective as possible to improve health services for the community and must be accompanied by the best possible maintenance of medical equipment (Roza, 2016).

Medical equipment as part of the medical equipment in this manual is those that require calibration, maintenance, repair, training, user, and decommissioning. This activity is usually managed by technical personnel (electromedical/clinical engineers). Medical equipment used for specific diagnosis and treatment of disease or rehabilitation after illness or injury may be used alone or in conjunction with accessories, operational materials, or other parts of medical equipment. The following are several types of basic medical devices, namely Abocath (infusion needle), Infusion set / Transet (infusion tube), Infusion fluid, Stethoscope, Tension (tensimeter), Thermometer, Tweezers (clip), and syringe (injection).

## 2.4. Maintenance/ Maintenance

Maintenance is an activity that aims to maintain or ensure that the condition of the building and its facilities and infrastructure is in good condition, can operate properly, and can be accepted by existing standards (Auliani, 2021). Maintenance is all activities carried out to maintain the equipment system so that work can be carried out according to order. Maintenance is also defined as an activity to maintain or maintain hospital facilities or equipment and repairs or adjustments and replacements are needed so that satisfactory production operating conditions exist as planned. It can be concluded, from maintenance activities are carried out to maintain or repair equipment to carry out production activities effectively and efficiently with quality product results. The maintenance system can be seen as a shadow of the production system, where if the production system operates at high capacity, the maintenance will be more intensive (Ahmadi et al, 2017).

The Big Indonesian Dictionary defines maintenance as the safeguarding of assets, especially the means of production so that they are durable and in good condition. The purpose of maintenance is to keep machines and equipment from damage and failure while they are in use. In general, the word maintenance will not be separated from the work of repairing, dismantling, or inspecting the machine carefully and thoroughly (Maintenance, Repair, and Overhaul – MRO). According to Ramadhani (2018), there are three (3) types of maintenance, namely:

1. Planned maintenance is a maintenance activity carried out on equipment according to a predetermined schedule. The maintenance schedule is prepared by taking into account the type of equipment, number, and qualifications of officers in accordance with the field and available financing. Planned maintenance includes preventive/preventive maintenance and corrective/remedial maintenance.
2. Preventive or preventive maintenance is a maintenance activity in the form of maintenance by cleaning tools which is carried out every day by operators and adjustment, lubrication and replacement of maintenance materials carried out by technicians regularly. Preventive maintenance aims to minimize the possibility of damage.

Corrective maintenance is a maintenance activity that is like repairing damaged equipment with or without the replacement of spare parts. Corrective maintenance is intended to restore the condition of damaged equipment to a condition that is ready for operation and can be functioned properly. The final stage of corrective maintenance is technical calibration, namely quantitative measurement of output and measurement of safety aspects. Maintenance also means performing routine actions to maintain the device (known as scheduled maintenance) or prevent breakdowns from occurring (preventive maintenance). MRO can be defined as, all actions aimed at maintaining or restoring components or machines in an ideal condition so that they can function properly as the company needs. A systematic maintenance schedule for medical equipment ensures that the equipment is safe to use and obtains maximum utilization at a reasonable cost (Mulyono, 2019). Another advantage is that it minimizes clinical and physical risks. Poor maintenance of medical devices can result in the short service life of these tools and have an impact on increasing the costs required for maintenance (Sumantri, 2019).

## III. METHODS

This study uses a qualitative single case study research approach to find out in-depth the facts to identify the treatment of Medical Medical Devices at Royal Prima Hospital Medan. Gerring defines a case study approach as "an intensive study of a single unit or a small number of units (cases), to understand a larger class of similar units (case population)". This research was conducted at Royal Prima Hospital Medan with the time from the preliminary survey to the data collection process from April to June 2022. This study only took one industry object so no sampling was needed and the researcher would conduct a direct survey of the hospital to obtain data that was required, namely all data related to the analysis of the treatment of Medical Medical Devices at Royal Prima Hospital Medan. The variables in this study consisted of independent variables and dependent variables, the independent variable included in this study was Treatment, then for the dependent variable in this study was Medical Devices at Royal Prima Hospital

Medan. The methods used for data collection are interviews conducted with officers in the ICU and IGD rooms at RSU Royal Prima Medan, documentation to collect secondary data in the form of documents related to the maintenance of medical devices at RSU Royal Prima Medan, for example, reports on medical equipment maintenance. In previous years, archival recordings were either in the manual or computerized form in the form of hospital charts, hospital organizational structures, in order to complete the profile of RSU Royal Prima Medan as the object of research, and observation by directly observing conditions in the field, both in the form of physical and mental conditions. behavior that occurs during the study.

The type of data in this study consisted of primary data and secondary data. Primary data was obtained from the object of research through interviews and observations. Meanwhile, the efforts made by researchers to obtain secondary data are by conducting searches and collecting documents, journals, and articles in the form of various information and information related to the problem being studied, such as through library searches and references/documentation records relating to the analysis of the treatment of medical devices at Royal Prima Hospital Medan as well as archive records in the form of hospital charts, and hospital organizational structures. Data analysis in qualitative research is a systematic test of data. Miles and Huberman in Sugiyono stated that activities in qualitative data analysis were carried out interactively and continued until they were completed so that the data was saturated. There are several activities in data analysis, namely data reduction (summarizing, sorting out the main points, looking for themes and patterns), data presentation (conducted in the form of brief descriptions), and conclusions (drawing conclusions and verification).

#### IV. ANALYZE AND RESULT

##### 4.1. Overview of Research Sites

Royal Prima Hospital Medan is one of the largest private hospitals and will become a referral center for the community, especially the city of Medan and the people of North Sumatra in general. A proud moment, on 17 May 2011, the Deputy Minister of National Education of the Republic of Indonesia, Prof. Dr. Fasli Jalal, Ph. D. laid the groundwork for the construction of the Royal Prima Hospital. On February 14, 2013, the Head of the Health Office of North Sumatra Province issued a Temporary Operational Permit to RS Royal Prima Medan No. 440.442/1641/II/2014. On February 16, 2014 RS. Royal Prima Medan was inaugurated by the Deputy Governor of North Sumatra Province, Ir. H. Tengku Erry Nuradi, M.Si with a Permanent Operational Permit from the North Sumatra Provincial Health Office signed by the Head of the North Sumatra Provincial Health Office, dr. Siti Hatati Surjantini, M.Kes.

##### 4.2. Characteristics of Informants

Following are the characteristics of the informants in this study which can be seen in Table 1 below.

**Tables 1.** Informant Character

Informant No.	Education	Position	Period of Work
1.	S1	Head of the Emergency Room	8 years
2.	S1	In charge of ICU	6 years
3.	D3	Responsible Medical Device Technician 1	3 years
4.	S1	Responsible Medical Device Technician 2	5 years

The informants in this study consisted of four people, namely the Head of the Emergency Room, the Person in Charge of the ICU, the Person in Charge of Medical Device Technician 1, and the Person in Charge of the Medical Device Technician 2. Of the four selected informants, one of them had the latest Diploma 3 education, while the other three had a Strata 1 education. All informants have worked for more than 3 years.

##### 4.3. Maintaining Medical Devices at Royal Prima Hospital Medan

The results of the study by conducting interviews with officers responsible for medical devices at Royal Prima Hospital Medan regarding how to maintain medical devices consisting of the head of the emergency room, the person in charge of the ICU, and the person in charge of the medical device technician, stated that to maintain medical devices treatment at Royal Prima Hospital Medan is carried out based on the type and shape of the medical device. The head of the emergency room said that maintaining medical health

equipment is the duty of all parties who use them, whether doctors, nurses or staff who work. For doctors, to maintain medical equipment, it is better to follow the existing procedures. The role of nurses in maintaining medical health equipment is seen in how they always maintain cleanliness, and placement of tools according to their place. Squeezing every staff in maintaining medical devices is to always pay attention to the cleanliness of every medical device, such as keeping the equipment clean from dust and other dirt. The person in charge of the ICU said that each tool was equipped with instructions for use and maintenance. The person in charge of medical equipment technicians gave feedback regarding the facilities and infrastructure to maintain medical devices where they said that the facilities and infrastructure in maintaining medical devices, for portable devices that must be moved from one place to another must be carried out safely. be careful and follow the procedures for moving the appliance properly. For infrastructure, they are tasked with checking tools every week or every month.

#### **4.4. Maintaining Medical Devices at Royal Prima Hospital Medan**

The results of the study by conducting interviews with officers in charge of medical devices at Royal Prima Hospital Medan regarding how to maintain medical devices consisting of the head of the emergency room, the person in charge of the ICU, and the person in charge of the medical device technician, stated that to maintain the medical device care at Royal Prima Hospital Medan is not much different from maintaining medical equipment. The informant said that the role of doctors, nurses, and staff in maintaining medical devices is the same as maintaining medical devices. Everyone has their own role but must still maintain it by following the procedures in its use. For guidelines on how to maintain medical health equipment, it is also equipped with guidelines for its use and maintenance.

#### **4.5. Protecting Medical Devices at Royal Prima Hospital Medan**

The results of the study by conducting interviews with officers in charge of medical devices at Royal Prima Hospital Medan regarding how to protect medical devices consisting of the head of the emergency room, the person in charge of the ICU, and the person in charge of the medical device technician, stated that to protect medical devices treatment at Royal Prima Hospital Medan is carried out by always carrying out routine maintenance both weekly, monthly and yearly. The facilities and infrastructure available to protect medical health devices are the availability of specialist technicians who are able to repair or control the condition of medical devices, and whose functions if there are problems can be quickly repaired. Procedures that regulate procedures for protecting medical devices are also available. If a tool is found that is not functioning properly, it can be immediately reported to the technician for repair. Facilities and infrastructure in protecting medical devices, the most important thing is competent human resources in terms of repair or service of medical devices that are always available in hospitals. This aims to overcome things such as if the device is damaged, then the HR in the hospital who understands the damage to the device can immediately repair it.

#### **4.6. Medical Device Treatment**

From the results of the study, it can be seen that for the treatment of medical devices, the Royal Prima Medan Hospital has several human resources in technician units with good quality and quantity, in addition to the role of doctors, nurses, and also hospital staff in carrying out medical device care, it shows good cooperation and mutual care for medical devices at Royal Prima Hospital Medan. In terms of maintenance of medical devices, technicians from medical devices always carry out routine checks at least once a week even without any damage to the medical device. Planned maintenance carried out by Royal Prima Hospital Medan includes maintenance activities carried out on the equipment according to a predetermined/arranged schedule. The maintenance schedule is prepared by taking into account the type of equipment, number, qualifications of officers in accordance with their field, and available financing. Planned maintenance includes preventive/preventive maintenance and corrective/remedial maintenance.

Preventive or preventive maintenance carried out by Royal Prima Hospital Medan to maintain, maintain, and also protect medical devices is using maintenance in the form of maintenance by cleaning tools which are carried out every day by operators and adjustment, lubrication and replacement of maintenance materials carried out by technicians periodically. Preventive maintenance aims to minimize the possibility of damage. Corrective maintenance is carried out by Royal Prima Hospital Medan to maintain, maintain and

also protect medical devices, namely by repairing damaged equipment with or without replacement of spare parts. Corrective maintenance is intended to restore the damaged equipment to a condition that is ready for operation and can be used properly. The final stage of corrective maintenance is technical calibration, namely quantitative measurement of output and measurement of safety aspects. In addition, guidance to nurses and technicians in maintaining, maintaining, and protecting medical devices also needs to be carried out to provide an understanding of medical devices.

## V. CONCLUSION

From the results of the research above, the conclusions of this study are:

1. The number of human resources in carrying out medical device maintenance at Royal Prima Hospital Medan has been maximized.
2. The exact amount of funds for the maintenance of medical devices at Royal Prima Hospital Medan is unknown, but each device already has its own budget in terms of maintenance and repair.
3. The placement of medical devices, especially in the ICU and IGD rooms, is in accordance with SOPs, it can be seen that their placement is regular and easy to reach by health workers such as doctors and nurses.
4. The maintenance of medical devices is routinely carried out, just like once a week, technicians always carry out maintenance on medical devices.
5. Supervision has also been carried out optimally by technicians if there are medical devices that are constrained in their operation.

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