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Information System Design of Medical Record for Hemodialysis Data Report: Patients Improving Care

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Abstract-The clinical management of patients with end-stage renal disease requires the integration of information based on voluminous data which accumulate daily. Because of the complexity of the process of dialysis and the need for continuous assessment treatment plans, all information of main parameters for each patient has been recorded, processed, stored and retrieved effectively. The purpose of this study to describe how data source of medical record can improve the patient care through information system design. This is an action research study conducted in dr. Soetomo Hospital. The step of design system covered context diagram and Entity Relationship Diagram. Data were collected by the in-depth interview and document study. The result of this study was a minimum data set for covering hemodialysis report, a number of patients visit, anemia maintenance, evaluation of serum phosphorus levels, nutrition, vascular access, blood pressure, and quality administration medical record service. We conclude that a minimum data set can be covering hemodialysis data report through the output of information system design such as the hospital report, clinical assessment material, provincial health office report, and kidney registry.

Index Term: Information System, Medical Record, Hemodialysis

1. INTRODUCTION

Because of the complexity of the process of dialysis and the need for continuous assessment treatment plans, all information of main parameters for each patient has been recorded, processed, stored and retrieved effectively. The availability of data on both the planned and delivered treatment may lead to a thorough analysis of the plan effectiveness. The adequacy of hemodialysis is important determinant of the quality of life and has a direct impact on morbidity and mortality of patients.

Hemodialysis is one of a therapy for end stage renal disease for kidney failure. In Indonesia, the number of hemodialysis patients have improved consecutively every year. The number of hemodialysis patient were 11.689 in 2014 and 30.554 in 2015. In east Java Province, the number of hemodialysis patients were improving from 2787 in 2014 to 6276 in 2015 [1].

The amount of hemodialysis were improved consecutively every year, the quality and quantity of the data are needed. It wll be done if the renal unit have given the report to the relevant agencies like provincial head office, etc. Informatic system are developed for the integration data and the systematic information in the all of government level to support a health management [2].

Disease registries, i.e., controlled lists of persons with a specified clinical condition and their associated data, are used to support public health and clinical research activities.

Based on the Health Ministry of Indonesia regulation No 1171/MENKES/PER/VI/2011 about health information system in the hospital, there are report form even period. The hospital data collection did directly used the various form which are available. For renal unit, the report form are RL 03 (the spesific health services), RL 04b (the morbidity and mortality data report form), and RL 05 (the incidence rate). Every nation should have a regulation about renal registries and renal unit should given a report form to the registries.

With the hope of better understanding ESRD, its treatment, and its associated costs, data are collected through public databases, registries, and proprietary databases. Therefore, Information System Design of medical record for Hemodialysis Data Report are needed for stability and health care improving to the patients.

2. METHOD

This is an descriptive study conducted in hemodialysis unit of RSUD dr. Soetomo in January 2017. The informant are 2 health medical record officers. The data were collected wth in-depth

interview methode and questionaire. We looking for the problem of the system problem and then designing a system design for medical record based on report data needed. The data was analyzed descriptively. The information data needed will describe in the Data flow Diagram, it explain about the infromation system design of medical record and the output will show the data report that needed aoutomatically.

3. RESULT AND DISCUSSION

Information needs obtained from the results of in-depth interviews with medical record staff and adapted to existing policies such as guidelines and hospital medical record procedures in Indonesia, medical records record dr. Soetomo Hospital and the consensus of the Indonesian Nephrology Association (Pernefri).

The need for information needed as an output component is as follows:

Tabel 1 Information Needs Design on Medical Record Information System in Hemodialysis Unit

No	Information Needs	Presentation Form	Period	Reference
Output Unit				
1.	SIRS RL 04b Data: - Number of new patients by sex and age - Number of visits	Graphs and Tables	Yearly	Guidelines for the Implementation of Medical Record in the hospital[2]
2.	SIRS RL 5.2 Data: Number of new visits and number of previous visits	Graphs	Yearly	Guidelines for the Implementation of Medical Record in the hospital[2]
Output Patients				
1.	Clinical component of HD patient:			
	a. Anemia (kadar Hb, g/dl) : - Normal : 10-13 - Abnormal: 1. moderate: 8-10 2. medium : 6-8 3. severe: <6	Table	Monthly	
	b. Bone Metabolism			
	- Phosporus, 3,5<P<4 1. <3.5 mg/dl 2. 3.5-4 mg/dl 3. >4 mg/dl	Table	Monthly	KDOQI, 2003[3]
	- Ca, 8<Ca<10 1. < 8 mg/dl 2. 8-10 mg/dl 3. >10 mg/dl	Table	Monthly	KDOQI, 2003[3]
	c. Nutrisi:			
	- Albumin (g/l), >35 - LDL-cholesterol (mmol/l) < 2.6	Table	Monthly	
	d. Akses Vaskuler - Femoral - AV Shunt - Double/Triple Lumen Subclavia - Double/Triple lumen Jugular - Double/Triple femoral - Lain-lain	Table	Monthly	
	e. Blood Pressure (Pre HD) - < 120 mmHg - 120-140 mmHg - >160 mmHg	Table	Monthly	KDOQI 2005[4]
	f. Blood Pressure (Post HD) - < 120 mmHg - 120-140 mmHg	Table	Monthly	KDOQI 2005[4]

	- >160 mmHg			
Quality Administration of The Medical Record Service				
1.	Percentage of charge completion medical reocrd within 24 hours after service completion	Table	Monthly	
2.	Completed Informed Consent after received clear information	Table	Monthly	
3.	Punctuality refund a medical record in ≤ 1 weekday	Table	Monthly	

Based on table 1 Clinical correlates are clinical or laboratory signs that can be objectively measured and are associated with disease activity, but not necessarily causally related to patient outcomes. The special subgroup of clinical correlates that is thought to have a causal relationship with a subsequent health outcome is referred to as surrogate outcomes[5].

When carefully selected and validated, indicators based on clinical correlates and surrogate outcomes may be useful as they are more easily obtained than outcome indicators [6], while also being more directly related to patients' health status than process indicators. However, parameters are often called 'surrogates' without a robust evaluation of their relation with clinical endpoints in large, well-designed studies that measure both surrogate and ultimate patient outcomes

From the above data needs analysis, the electronic medical record system design is as follows:

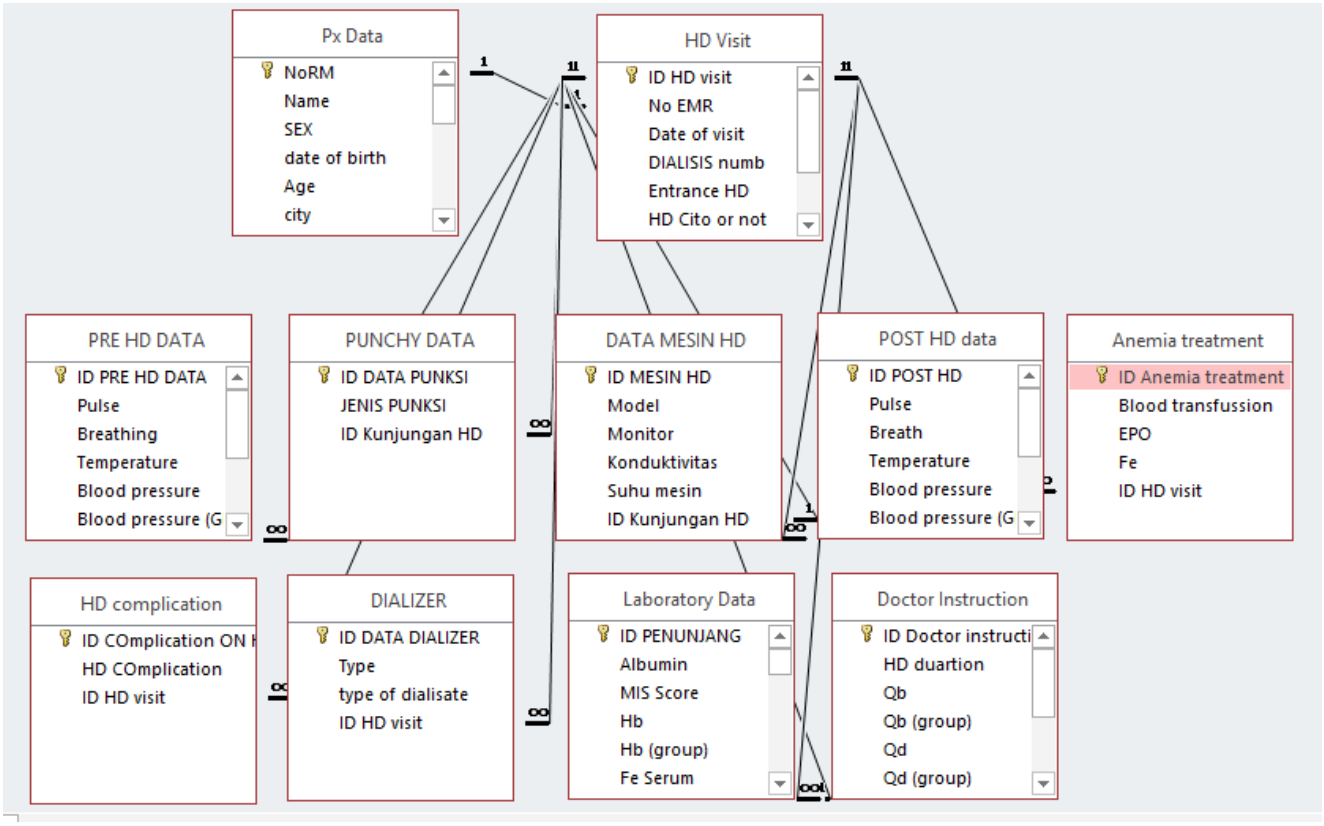

Fig 1. The Entity Relationship Design (ERD) of Data Needs Analysis, The Electronic Medical Record System Design

4. CONCLUSION

The design of the components of the process of developing the medical record information system is the process of collecting data from the medical record files and then in the entry to the computer in accordance with the design of DFD and databases medical record information system and data processing on new variables according to the design. Processing is done by processing the existing data source into information a report by making entry into the computer by using MS Access sent to the Indonesian Renal Registry (IRR) via email.

5. ACKNOWLEDGEMENT

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