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## DOCTOR'S COMPLIANCE TO CLINICAL PATHWAY OF ISCHAEMIC STROKE: A CASE OF PRIVATE HOSPITAL IN INDONESIA

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**Abstract.** Clinical Pathways (CP) is a complex, multidisciplinary and integrated service planning concept based on the best clinical practice for a group of patients with a specific diagnosis in accordance with Evidence Based Medicine. CP is a disease management tool that is widely used in hospitals, a relatively new field in health services. Evaluation of CP after implementation is an important step to assess hospital management performance. The positive effect of the CP implementation is to reduce medical costs, Length of Stay (LOS) significantly, and variations in services that are not needed; improve patient satisfaction and quality of care. The Effectiveness of CP will be maximized, if there are organizational support, commitment and compliance from the doctor to the implementation of CP in stroke management. The aim of this article was to analyze the commitment and perceptions of doctors on organizational support and the level of doctor's compliance with the implementation of CP. This study uses a quantitative method, carried out inpatients unit of private hospital in Indonesia, with the data sample of 27 CPs inpatients with Ischemic Stroke during 2018 and the respondents were 10 doctors who provide medical care to inpatients with IS. Data collection using form instruments of CP IS to obtain LOS and complications: organizational support and commitment is obtained using a questionnaire. Data analysis with univariate analysis for descriptive statistics of each variable (commitment, organizational support, LOS, complications). The results of the statistical analysis showed that the doctor's commitment to the implementation of CP was 71.9%, the doctor's perception of organizational support in implementing CP was 67.67%; doctor's adherence to CP implementation based on the accuracy of LOS in IS cases without variants was 100%, based on the accuracy of laboratory examinations was 100%, based on the accuracy of radiological examination (head CT scan non contrast) was 91.3%. The average LOS was 3.93 days, maximum LOS: 8 days which is 1 patient. 4 patients with variants (complications). The cost of inpatient BPJS compared to INA CBGs rates is overcost of 33.3%.

**Keywords:** Clinical Pathways, doctor's compliance, commitment, organizational support

## 1. INTRODUCTION

Clinical pathways (CP) is a disease management tool that is widely used in hospitals (Ismail, Aljunid, Suh, 2008), especially in the US, up to 80 percent of hospitals have used CP for some indications (Rotter, T, Kugler, J, Koch, R, et al, 2008). CP has grown rapidly in the last 15 years, is a relatively new field in health services (Van Herck, Vanhaecht, Sermeus, 2004). CP is a complex, multidisciplinary treatment plan (Aniza I, Saperi S, Zafar A, et al., 2016), and integrated based on the best clinical practices for groups of patients with certain diagnoses according to Evidence-Based Medicine (Panella, M, Marchisio, S, et al., 2003, Al-Ashwal, R, Supriyanto, E, 2016). CP evaluation after trial and implementation is an important step to assess hospital management performance (Rania, H, Eko, S, 2016). CP implementation is associated with improved performance without reducing the quality of care (Aniza I, Saperi S, Zafar A, et al, 2016). The type of hospital performance includes cost, compliance with the best practice processes of care and Length of Stay / LOS (Caroline A, Brand A, Barker R, 2012).

The majority of literature, globally, concluded were positive effects of the implementing CP, namely reducing medical costs (Ismail, Aljunid, Sulung, 2008), LOS significantly (J Cheah, 2000, Rotter T, Kinsman L, James E et al, 2010), service variations which was not needed (Cheah, J, 2000, Panella, M, Marchisio, S, et al., 2003), and reducing complications in stroke management, such as aspiration pneumonia and urinary tract infections (David Sulch, Lalit Kalra, 2000); maintain or even improving quality of care (Pearson, Fisher and Lee, 1995), improving patient satisfaction and quality of care in stroke management (Di Huang, XuPing Song, 2015) and coordinating services within scarce resources (Dowsey, et al, 1999, Hoffart and Kuckelman, 2000, Kohn et al., 2000, Every et al., 2000). However, due to insufficient attention and support given to applying these guidelines into daily practice in hospitals, their effectiveness is not very good and there is limited evidence to support the benefits of CP in health care (Panella, M, Marchisio, S, et al, 2003) including effects on stroke management are also unclear (Di Huang, XuPing Song, et al., 2015).

A private hospital in Purwokerto has set the priority for CP measurement in the Departement of Neurologic in 2018 namely Non-Hemorrhagic Stroke/ Ischemic Stroke (IS). Stroke is a global health problem and is the second commonest cause of death and a major cause of adult disability worldwide. Every year, 15 million people worldwide suffer a stroke. Of these, 5 million people died and 5 million are left permanently disabled (Malaysian Society of Neurosciences, 2012). The prevalence of stroke in Indonesia in 2018, based on RIKESDAS increased from 7 percent to 10.9 percent. Studies in 10 Class A and Class B hospitals belonging to the Ministry of Health since January-March 2012 report that the cost of replacing catastrophic disease claims (including strokes) based on INA CBGs is greater than the real cost based on hospital rates (Wasis, B, Mugeni, S, 2012). However, the results of research conducted by Nurwahyuni, A et al (2018) showed that LOS, variations in laboratory support services and drug use actually increased after the adoption of CP in The Indonesian National Health Insurance System's era and that it was caused by doctor's compliance with the formulary, while data at a private hospital in Purwokerto showing the number of BPJS patients hospitalized with Ischaemic Stroke in 2017 - 2018 was 83 patients and 39.7 percent of BPJS patients exceeded the INA-CBGs rates. For this reason, the author considers that it is necessary to analyze doctor's compliance with Clinical Pathways of Ischaemic Stroke.

This article aimed to analyze the commitment and perceptions of doctors on organizational support within the implementation of CP and identify the level of doctor's compliance with CP of ischemic stroke.

This research was conducted at a private hospital in Purwokerto. The researcher chose a stroke, because it included the top five diseases based on high volume, high cost, high risk and predicted recovery (Zander and Bower, 2000, KEMENKES RI); and Ischemic Stroke (IS) compared

to Hemorrhagic Stroke (HS), because many patients with HS at this hospital were referred to the Stroke Center, the Margono Soekaryo General Hospital or the Banyumas General Hospital.

## LITERATURE REVIEW

The criteria for diagnosing ischemic stroke are symptoms of global neurological deficits (in the form of impaired consciousness) or one / several focal neurological deficits (can be in the form of hemiparesis/ hemiplegia / paraparesis, paralysis of an extremity, paralysis of the driving muscles of the eyeball, driving muscles of the eyeball, muscles for swallowing, speech and so on; impaired balance function, smell function, visual function, auditory function, sensory somatic function, neurobehavior disorders) which occur suddenly, as evidenced by neuroimaging examination (Computed Tomography Scan or Magnetic Resonance Imaging) (PERDOSSI, 2016).

Definition of Clinical Pathways (CP) is an integrated service planning concept that summarizes each step given to patients based on medical service standards and nursing care and evidence-based standards of health care workers (pharmacists, nurses, nutritionists, physiotherapists) with measurable results and within a certain period of time as long as the patient is admitted to the hospital.

The effectiveness of using CP as a quality control tool is still under debate. There are various studies on the effectiveness of CP but the results are still inconsistent due to various research biases. Some studies that show the effectiveness of CP are as follows:

- a) Save the use of facilities, improve clinical outcomes, increase patient satisfaction, and clinical practitioners, and reduce maintenance costs (Evan, 1999, Tokarsky and McLaughlin, 1995)
- b) Facilitating early discharge, increasing the quality of life index (Feagan, 2001)
- c) Reducing the length of stay, improving clinical outcomes, increasing economic outcomes, reducing unnecessary actions (Evan, 1999, Darer, Pronovost, Bass, 2002)

### *Length of Stay (LOS)*

Duration of stay is defined as the difference calculated between the date of entry and the date of exit. Patient return or death in one day is included as one day LOS (J Cheah, 2000). LOS is an important measure of resource utilization. Analyzing LOS outliers is very important for hospital management and financing, especially because it is closely related to hospital costs (Malgorzata C, 2010). LOS is the most commonly used outcome measure with most studies reporting statistically significant reductions after CP implementation (Rotter T, Kinsman L, James E, Machotta A, Gothe H, Willis J, Snow P, Kugler J, 2010). This is achieved without adverse effects on short-term clinical outcomes such as hospital mortality, rates of complications and morbidity (J Cheah, 2000).

### *Doctor in Charge of Services*

The doctor in charge of services is responsible for patient care from the time of the patient enters the hospital to go home, has the competence and clinical authority according to his clinical appointment. The doctor in charge of services in this study is a neurologist and general practitioners, doctors on duty at the emergency department.

### *Factors that influence compliance in the implementation of CP*

Zannini, et al. reported that CP increases the workload of bureaucracy and problems can arise in the relationship between doctors and regional health authorities. Nurfaida in her research on the application of CP through a case study in the Emergency Services of Dr. Saiful Anwar Malang Hospital concluded that the constraints in implementing CP were the absence of doctor's commitment, clinical leadership, and clinical management support; and lack of responsibility in filling and implementing a CP (Evans-Lacko, et al., 2010); there is a gap between medical staff in following the latest developments in clinical service standards (Pinzo, 2014). Results of the research conducted by Nurwahyuni.A et al (2018) showed that LOS, variations in laboratory

support services, variations in drug use increased after the adoption of CP in the JKN era and that was caused by doctors' disobedience with the formulary.

Organizational factors that influence the application of CP, according to Evans-Lacko, et al (2010), Fitri. D, Sundari. S (2018), is the lack of human resources, limited time, lack of training related to the implementation of CP, and lack of support from hospital leaders. Providing special personnel, a case manager who functions to monitor the course of CP will greatly help the success of CP (Pinzo, 2014). In Michigan, BlueCross BlueShield of Michigan (BCBSM) provides incentives for oncologists to participate in the program and reward doctors for using the CP. Doctors using CP Oncology receive support through either the A S Oncology EMR system or via a web-based portal (Dean H, Gesme, 2011).

Doctor's compliance with the implementation of CP

The definition of a doctor's compliance with CP is the medical staff's compliance within using CP to provide standardized and integrated patient clinical care to minimize the variation in clinical care processes. A doctor's compliance is measured by the accuracy of LOS, laboratory and radiological examination (CT imaging) according to CP in cases without additional variants. The variant can be due to the clinical condition, comorbidities, complications or medical errors (medical errors).

Laboratory examination support that must be carried out by CP IS determined by a private hospital in Purwokerto, which is a complete blood test, blood glucose, kidney function test (Ureum, Creatinine); Radiological imaging test, that must be carried out following CP is a head CT scan without contrast.

## RESEARCH METHODS

This study uses a quantitative method because it defines variables, such as commitment, organizational support and doctor's compliance with the implementation of CP. Conducted in the Departement of Neurology at a private hospital in Purwokerto, with the object of research, namely Doctor's compliance with CP; The research subject was Doctors in Charge of Services, doctors on duty at the emergency department (GP) and a neurologist. The target population is all cases of IS who are admitted to the private hospital in Purwokerto during 2018. The sample size was national assurance's patients who were hospitalized, diagnosed with IS during 2018, namely 27 patients, and the number of Doctor in Charge of Services' respondents who provided clinical care for patients with IS, were 10 doctors. The data collection technique uses a questionnaire to measure variables, are commitment and organizational support; and using an instrument of CP form to obtain LOS data and complications. Data analysis techniques with univariate analysis for descriptive statistics of each variable.

## RESULTS AND DISCUSSION

During 2018 the total number of BPJS inpatients care of ischemic stroke was 27 patients. With patient characteristics, minimum age: 32 years, maximum age: 82 years, mean: 63.4 years, 72 years mode; the highest sex is male (63%) and other characteristics are listed in the table below.

Table 1. Characteristics of patients (N=27).



Characteristic of patient	Group	Number of patients	Percentage (%)	Information
Age	≤40 y.o	1	3,7	
	>40 y.o	26	96,3	
Sex	Male	17	63	
	Female	10	37	
LOS	<8 days	26	96,3	Mean 3,93 days
	≥8days	1	3,7	
Complication	Yes	4	14,8	Pneumonia 2 (50%) Septicaemia 1(25%) Febris unknown origin 1 (25%)
	No	23	85,2	
Cost	INA-CBGs > hospital real cost	18	66,7	Going up to next level: Yes (66,7%) No (33,3%)
	INA-CBGs < hospital real cost	9	33,3	
Adverse event	Yes	1	3,7	Patient falls
	No	26	96,3	

The mean LOS of hospitalized patients with IS in 2018 was 3.93 days, SD 1.466, minimum one day of care, maximum 8 days of care; and patients who experienced complications during treatment were 4 patients (14.8%), that was 2 (50%) patients with pneumonia, 1 (25%) patients with sepsis, and 1 (25%) patients with febrile unknown origin. Total of 9 patients (33.3%) with over cost, namely real hospital costs greater than the costs of INA-CBGs; with 6 patients (66.7%) going up to VIP-VVIP A class, and 9 (100%) patients being treated with complicated diagnoses with comorbid of Hypertension, Pneumonia, Type 2 Diabetes, Acute Kidney Injury, Ischemic Heart Disease, Chronic Heart Failure, Coronary Heart Disease. In balance Electrolyte disorders, which require joint care by 2-3 Doctor in Charge of Services's (neurologist, internist specialist, cardiologist and medical rehabilitation specialist); requires additional laboratory tests, such as CKMB, troponin, serial blood glucose tests, electrolyte serial tests, Thorax X-Ray; and get additional therapy outside the main therapy for IS: 1 (3.7%) patient experienced Adverse Events (the incidence of patient falls). The accuracy of LOS in the CP IS was determined by a private hospital in Purwokerto is ≤8 days, meaning that the accuracy of LOS inpatients during 2018 is 100% according to CP.

Table. 2 Characteristics of respondents, doctors (N=10).

Characteristics of respondents	Group	N	Percentage	Total
Age	≤40 y.o	8	80	10
	>40 y.o	2	20	
Sex	Male	5	50	10
	Female	5	50	
Level of education	GP	8	80	10
	Neurologist	2	20	
Work experience	≤5 y.o	4	40	10
	>5 y.o	6	60	

The characteristics of respondents, doctors, in this study were a minimum age of 27 years, a maximum of 52 years, an average of age was 36.5 years; Minimum: 1-year work experience, maximum: 22 years and an average of age was 7.8 years.

Table. 3 Observe variable (N=10).

Variable	Group	N	Information
Commitment	Very high	71,9	High
	High		
	Quite High		
	Low		
Organizational support	Very high	67,67	Quite High
	High		
	Quite High		
	Low		
Doctor's compliance with CP in cases without variants is seen from:	Very low	23(100%)	N: 23
	Yes		
	No		
	Yes		
• LOS	No	23 (100%)	N: 23
	Yes		
	No		
	Yes		
• Laboratorium	Yes	21 (91,3%)	N: 23
	No		
	Yes		
	No		

- Imaging test (CT scan) N: 23
- N: 23

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From this research, it was found that the doctor's commitment was classified as a high level (71,9) and doctors' perception of organizational support was quite a high level. There were 27 patients diagnosed with ischemic stroke, there were 4 patients with variants because of clinical condition/ comorbid and the occurrence of complications, with Doctor's compliance with CP SI in cases without variants, based on LOS was 100%, based on supporting laboratories was 100%, and based on radiology imaging CT scan is 91.3% (2 patients were not examination to Head CT scan imaging).

## CONCLUSION AND IMPLICATION

Evidence-based clinical pathways can be used to improve the quality of care, reduce costs (with reducing LOS), and decrease inappropriate variants in clinical practice of ischemic stroke and improve patient safety. From this study it can be seen that the doctor's commitment to the implementation of Ischemic Stroke CP at a private hospital in Purwokerto is high; the doctor's perception of organizational support in implementing the CP is quite high and; doctor's compliance with the implementation of CP SI based on the accuracy of LOS is high (100%), based on the accuracy of laboratory examinations is high (100%) and based on the accuracy of radiological imaging examination, CT scan is classified as high (91.3%). But in this study it was reported that the cost of care, INA CBGs compared to the real of the hospital cost there were over cost (33, 3%). These results provide evidence that there is still ineffectiveness in the implementation of CP which needed to be further research and suggestions for subsequent research need to be analyzed how the impact of CP before and after implementation by measuring patient outcome and how much the Readmission Rate (RR) is an output indicator. The implication for hospital management is that it is necessary to carry out continuous socialization of CP to all caregivers and that organizational support is needed for the implementation of CP so that CP can be applied more effectively and efficiently to improve service quality and patient satisfaction.

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