

STANDARD PROCESSES OF ELECTRONIC CLINICAL PATHWAYS THAT SUPPORT DECISION MAKING AND TEAMWORK COMMUNICATION

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ABSTARCT: *The present study was performed to determine the standard processes of computerized Clinical Pathways to support decision making process. The standard processes of computerized Clinical Pathways to support decision making process determined and investigate from literature review, and these processes should be embedded in Health Information System. Three processes with a set of functions should be considered in development and implementation of Clinical Pathways, and these processes were classified into three categories: medical, administrative, and decision making, and these processes has a set of functions, factors, and indicators. We proposed three standard processes with a set of function, factors, and indicators which required for Clinical Pathways to be embedded in Health Information System. This study will aid in the future development and implementation of Clinical Pathways as computerized system.*

INTRODUCTION:

Clinical pathways were introduced by Zander in the mid of 1980s, adopting clinical pathways were useful to improve healthcare quality and patient safety, clinical pathways provide a shared language and inspire everyone to look at the whole patient and entire healthcare process [1, 2]. Clinical pathways was implemented in New England Medical Center in Boston (USA) between 1985 and 1987 to reduce the length-of-stay (LOS) and reduce the cost [3]. On the other hand clinical pathways implemented in the late 1990s to consider as a tool for designing care processes [4]. Clinical pathways were adopted for many diseases and in many medical centers around the world. There have been effectiveness of electronic clinical pathways on healthcare outcomes [5, 6]. However, there have been few research or reports concerning the detailed processes of electronic clinical pathways with regard to demand definition. Alexandrou, Lenz, Mans, and Zhen propose a set of medical processes [7-9], on the other hand there are a set of administrative processes proposed by Alexandrou, Lenz, and Zhen. Medical processes defined four functions based on ontology [7]. In the present study we examine necessary processes for electronic clinical pathways to support medical and administrative staff, by defining these processes and how these processes will support decision making and teamwork communication, medical processes will support physicians and nurses in treatment and diagnosis processes, while administrative processes will support the management to control medical staff performance and utilize medical resources, we discuss electronic clinical pathways processes to effective design to improve healthcare quality.

Method

This investigation was performed at previous work of Health Information System (HIS), decision making process in HIS, and Teamwork Communication in HIS. These qualitative methods are an appropriate choice to extract and analyze Clinical pathways processes.

According to the European Pathway Association (E-P-A, www.E-P-A.org) defines a clinical pathway as: "A complex intervention for the mutual decision making and organization of predictable care for a well-defined group of patients during a well-defined period."

Clinical pathways is an integrated medical treatment protocols, nursing care plan, and other healthcare activities, Clinical pathways support implementing evidence-based care, clinical pathways standardized healthcare treatments, the main objective for clinical pathways is to improve the quality of care and reduce the cost. One of method to improve the quality is to redesign the healthcare process, the aim of this redesign healthcare process will adopt in clinical pathways to utilize resources [10, 11].

Based on the definition and characteristics of clinical pathways, clinical pathways should support decision making process beside the treatment process [12], so standardized these requirements for clinical pathways are essential to success its implementation and as a process for its objectives. Clinical pathways have two main processes:

1. Medical process: the processes present the structure of the clinical pathways. These structures are:
 - a. Timeline: this function explains present the start and end point for all stages of patients from admission to discharge.
 - b. Category of care: this function explains and present diagnosis and treatment processes.
 - c. Outcome criteria. This function explains and presents criteria for each clinical pathway.
 - d. Variance record: This function explains and presents reasons for variance and deviations from the program of care outlined in the Clinical Pathways.

Table 1 illustrates the functions and structures of medical process of Clinical Pathways.

RESULTS

Table 1: Medical process (functions and structure).

Author	Medical functions			
	Timeline	Category of care	Outcome criteria	Variance record
[13]	√	√	√	√
[4]	√	×	×	√
[7]	√	√	×	√
[5]	√	×	×	×
[6]	√	√	√	√

2. Administrative process: These processes present the leadership, teamwork communication, care coordination, how the management will control the activities for the medical staff [5-9].

Table 2 Administrative Processes Functions

Author	Administrative Functions					Other functions
	Resource utilization	Leadership	Teamwork communication	Care coordination	Resource utilization	
[13]	√	×	×	×	×	×
[4]	√	×	×	√	×	×
[7]	√	×	×	√	×	×
[5]	√	×	×	×	×	×
[6]	√	×	√	√	√	√

As mentioned above, Clinical Pathways has two main processes medical, and administrative processes, and these processes has a set of function which should be imbedded in HIS, there is another process which support decision making process, this process present the main goal of Clinical Pathways which depict in support physicians in taking decisions in their work. Decision making process is the third process in Clinical Pathways.

Decision making process

To implement clinical pathways and consider the decision making process factors and consider it as a structure of clinical pathways, these factors are Tasks, Team, Context, Knowledge, and Technology [8-10,14-18]. To support decision making process it is essential to consider factors that effected. The following table 2 summarizes these factors:

Table 2 present decision making process factors

The result of this investigation in the literature, we conclude that implement Clinical Pathways to improve healthcare quality by support decision making process, need to Standardized all processes which improve healthcare quality, these processes can be formulate as a standard guidelines, this guidelines formulated as following in figure 1.

DISCUSSION:

There are a few methods to present Clinical Pathways; also there are no standard guidelines to present Clinical pathways

in electronic, in other words, there is no studies investigate the Clinical Pathways processes in order to support decision making process to improve healthcare quality.

Table Administrative Processes Functions

Author	Factor				
	Tasks	Team	Context	Knowledge	Technology
[10,16]	×	√	√	√	×
[9,15]	×	√	√	√	×
[8,14]	√	√	√	×	×
[11,17]	×	√	×	√	√

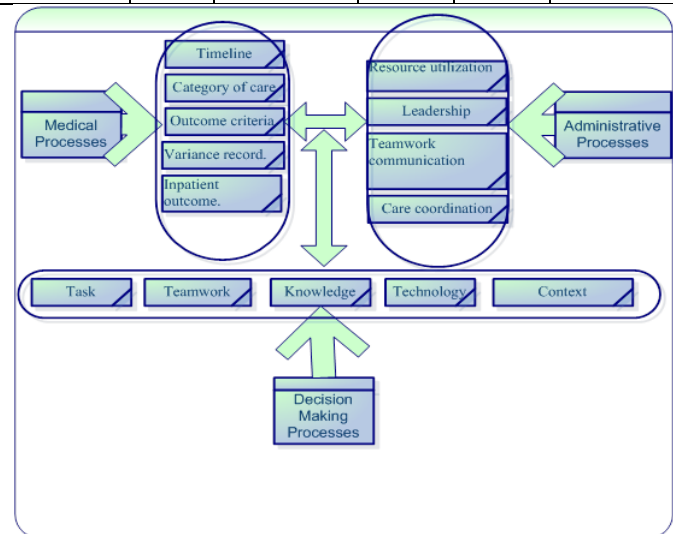


Figure 1 Clinical Pathways Standard Processes

Implementation of Clinical Pathways as computerized system; may solve the paper based system and fill the gap in the current HIS which has a shortage in supporting decision making for physicians and medical staff. Here we discuss the significance of each category.

Medical Processes

The main processes which present by Clinical Pathways are medical processes; these processes present the timeline for diagnosis and treatment of the patients, category of care present the type of every diagnosis and treatment of the patients, outcome of patients present the indicators for every patient to calculate a set of indicators like length of stay, mortality, morbidity, readmission, etc. variance present the core function of Clinical Pathways, variance present the difference between the expected and the happened situation for patients.

Administrative Processes

As mentioned that medical processes are the main goal for Clinical Pathways, in this situation there is a need to control these processes by developing and add a set of processes to make sure that medical processes are in the right path, these processes depicts in leadership, teamwork communication, and care coordination.

Decision Making Process

To improve and enhance Clinical Pathways in supporting decision making process, there is a need to consider a set of factors in developing and implementation of Clinical Pathways, these factors are task, how the medical staff task will present, teamwork will activate clinical pathways the teamwork facility to improve healthcare quality, knowledge how to present Clinical Pathways knowledge, context present the domain of Clinical Pathways, and technologies which will support implementation of Clinical Pathways and facilitate the presentation of these factors.

CONCLUSION:

In the present study, we proposed three processes to implement Clinical Pathways to support decision making process in order to improve healthcare quality. Medical processes, administrative processes, and decision making process are three processes which should consider when developing and implement Clinical Pathways; these processes will be appreciated in developing and implement Clinical Pathways, and these processes has a set of functions.

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