Chapter 8
Clinical Pathway Enhanced by Knowledge Management Technology:
A Critical Step towards Medical Quality Improvement

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ABSTRACT

Clinical pathways are complex processes based on knowledge and personal experience, which are essential for high quality patient treatment. However, the insufficient knowledge coverage and representation for detailed clinical pathways makes it difficult to provide accurate information to improve patient safety. The gap between the dynamic practical treatment process and the predefined clinical pathways knowledge becomes an important issue. This chapter discusses how knowledge management enhances the implementation of clinical pathway to achieve medical quality improvement. The relationship between patient safety and the effectiveness of clinical pathway knowledge is discussed. The clinical pathway knowledge management pattern is derived in the context of healthcare knowledge management. More specifically, a norm-based approach is proposed to represent and manage clinical pathway knowledge. Types of knowledge can be represented comprehensively with the taxonomy of norms as useful building blocks to construct the dynamic and accurate clinical pathway knowledge. The multi-agent system embedded with norms is developed to enhance clinical pathway management in the context of complicated healthcare environment. Finally, social-technical issues of implementing knowledge management technologies in practical treatment process are discussed.

1. INTRODUCTION

In order to improve the quality of service and efficiency and optimise the use of resource, clinical pathways aim to form a standard to manage medical activities since the 1980's. The clinical pathway, also called care plan is defined as the management plan that displays goals for patients and provides the sequence and timing of actions necessary to achieve these goals with optimal efficiency (Luc and Todd, 2003). The benefits brought by the application of clinical pathway include greater consistency in practice, improved continuity of care, monitored standards of care, improved clinical documentation, the implementation of evidence-based practice and the delivery of care which is patient-focused and designed around the patient's/ user's requirements rather than the organisation.

However, although the medical activities and processes for a certain diagnosis are clearly defined in the pathway document, there still exist gaps between the documented clinical pathway and its execution. The clinical pathway management is a knowledge based, dynamic, complicated, collaborative process which need clinical knowledge to support decision making, dynamic evolution with the variance and up-to-date pathway evidence, complicated execution involving the guidance of medical pathway and the support of organisational procedure (ordering, scheduling and reporting), as well as the collaborative work among healthcare professionals from different departments. Therefore, there need a systematic management for all the issues related to the application of clinical pathway. The current state of development for clinical pathway no matter paper based or the electronic version has some limitations to support management for the complex clinical pathway application and can hardly fill the gap between the predefined Clinical pathways and their actual application. In the practical treatment process, the lack of knowledge sharing and information accuracy of paper-based clinical pathways burden health-care staff with a large amount of paper work. This will often result in medical errors, inefficient treatment process and thus poor quality medical services.

This chapter will discuss how knowledge management enhances the implementation of clinical pathway to achieve medical quality improvement. Patient safety issues in practical treatment process caused by the low-effective use of clinical pathway knowledge will be discussed, followed by current researches on healthcare knowledge management and discussion on clinical pathway knowledge management pattern. Norms, as the knowledge covering different aspects of practical treatment process, will be discussed to provide a norm based integrated clinical pathway management approach. Finally, social-technical issues of implementing knowledge management technologies in practical treatment process will be discussed.

2. UNLOCKING CLINICAL PATHWAY KNOWLEDGE FOR BETTER PATIENT SAFETY

2.1 Clinical Pathway and Patient Safety

Clinical pathways – also known as integrated care pathways, coordinated care pathways, care maps or anticipated recovery pathways – are task orientated care plans that detail essential steps in the care of patients with a specific clinical problem and describe a patient's expected clinical course (Coffey et al, 1992; Kitchiner & Bundred, 1996). The concept was introduced for the first time at the New England Medical Centre (Boston, U.S.A) in 1985, originally by Karen Zander and Kathleen Bower. Clinical pathways is a result of adapting documents used in industrial quality management known as Standard Operating Procedures that aims to improve efficiency in the use of resources and task completion within a set time. Clinical pathways offer a structured approach in developing

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