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Effectiveness of Care Pathways in Ideal Hospital Management System: A Review

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ABSTRACT: Hospital is the medical institution where sick or injured people are given medical or surgical care irrespective of their socio-economic status. Health care givers and administrators are considered as health care professionals. The form of hospital services, their organization, development, operation and administration have undergone significant differentiations during the last 20 years. Public dissatisfaction with the traditional role of hospitals has grown vastly which may be attributed to the implementation of issues such as changed quality of life and cost-effectiveness, wide media coverage of system inadequacies, increased demands and awareness of patient's rights, limited resources in the era of expensive hi-tech medical support systems and traditional approaches of regulatory bodies. Hospitals across the country are searching for effective quality improvement strategies. Implementation of care pathways in the hospital management will improve the quality of care, standardization of care processes, bring into limelight the existing flaws, suggest ways for future improvements, help to utilize resources in a cost effective manner which is essential both in developed as well as developing countries. In this review attempts have been made to highlight on the strategic points like the implementations and utilities of clinical care pathways and its role in the control of emergency medical cases like strokes, importance of timelines and key performance indicators of health administrators, effectiveness of clinical decision making of medical professionals and their overall contribution in the quality improvement of health care and thus hospital management.

KEYWORDS: Health Care Administration; Hi-Tech Medicine; Clinical Care Pathways; Clinical Decision Making; Key Performance Indicators.

INTRODUCTION

A hospital is the place where every socioeconomic group seeks healthcare. The context in which the hospitals are working is also changing rapidly because of the increase in aged populations, the changes in diseases themselves, the impact of new treatment options and introduction of IT technology [1]. A hospital regarded as ideal today may not

be ideal in the coming future. Hospitals are complex purposeful organizations constantly dealing with life or death matters. In order to improve quality of care, gain patient's satisfaction and implement quality improvement strategies different researches carried out by different members of socio-economic research institutes have identified and described certain key factors that contributed to adopt successful strategies. They opined that the time has come to make up minds about what hospitals should look like in the near future to fulfill the requirements of modern medicine and demographic changes. Proper motivation for work and commitment to achieve the desired target, fulfillment of mission can be regarded as key factors for success of the top performing noteworthy hospitals. Such commitment should be reflected among the administrative bodies to working class. Next important strategy is to appoint right person for the right job and this should be applicable for physicians, nurses, administrators, and ancillary staff so as to form a good multidisciplinary team, each member of the team acting as team player, performing his own responsibilities, participating in QI or patient care management [1,2]. Monitoring of doctors on staff and motivating them that they must continue to meet certain performances and maintain standards are to be encouraged. High quality nurses should be employed providing them competitive salaries and deserved reputation of respect and given opportunity to be true partners with physicians in caring for patients. Top-performing hospitals also put great emphasis on keeping staffing levels high and vacancy levels low and develop effective in- house processes.

The best hospitals not only collect data on outcomes and co st, but also pull apart the numbers on surgeries, tests, and o ther procedures to identify each step in the process where b est optimized medical approaches are practiced[2]. In quality hospitals flaws/drawbacks or deficiencies are never hidden or ignored but are brought to limelight for proper discussions and corrective measures adopted against them. QI departments should be adequately staffed, and properly trained to facilitate the problem solving process [3-5]. Members of health team should be given the proper rights to raise questions and the root causes are to be properly analyzed and proper plan of action to be implemented with timetables and goals. And finally investments in IT and to equip the QIP departments with qualified staffs that will abstract medical records, analyze data, access to guidelines and protocols and thereby facilitate the QI process. Stress should be given to enhance efficiencies by improving patient flow and reducing waiting times, to speed up test results, increase the speed and safety of patient transport and reducing variations in medical devices and supplies [6-9].

Many evidences are available which shows the overuse, misuse and underuse of potentials in health care systems. Unnecessary use of expensive diagnostic and surgical procedures, putting patients at un-needed risks and escalating health expenses, unsuccessful adoption of IT in some hospitals are the examples of overuse or misuse of potentials. Under use of needed medical services and devices are wide spread [1].

In this review, discussions will be done on the implementation of care/critical care pathways in terms of quality, efficacy and safety, stroke care pathway and stroke rehabilitation, clinical decision making, and the role of medical and para-medical staff including Hospital managers and administrators in the hospital management systems.

Critical Care Pathways

Critical care pathways also known as integrated care plans or care maps, care pathways or clinical pathways. The critical care pathway concept appeared for the first time in 1985 inspired by Karen Zander and Kathleen Bower at the New England Medical Center in Boston (Massachusetts, USA). Care pathways are usually represented as a Gantt chart. A care pathway is a multidisciplinary healthcare management tool. Care pathways are considered to be one of the best tools that hospitals can use to manage the quality in healthcare concerning the standardization of care processes, chalk out healthcare plans for a specific group of patients by the professionals and thereby promote organized and efficient patient care, reduces the variability in clinical practice and improves outcomes[2,3,5,10,11].

While introducing critical care pathways it is necessary to review current processes in the light of national and international recommended practices. Necessary improvements to be made, to achieve the achievable in an easier, quicker way, change and removal of the existing barriers are the key points to be kept in mind while implementing care pathways [12]. The basic reason behind implementation of Critical care pathways in both developed and developing countries is to utilize all resources as efficiently as possible, check on the unnecessary expenditures, develop a multidisciplinary health team, analyze the causes behind success and failures and finally to improve the quality of care[13,14]. As a powerful tool for care process management and important component for Continuous Quality Improvement (CQI) care pathways helps in fixing healthcare plan and standards, introduce clinical audits, helps to promote coordination and cooperation among professionals, and do the needful for patient satisfaction.

Critical care pathways should be introduced one at a time so that all members learn from same format or template in a shorter time. It's hard to draw conclusion as regards the development of care pathway, whether it reduces cost or increases efficiency but still researchers have found many beneficial aspects like its easy use, reduction of paper work, enhancement of communication links between health care workers and patients, provide opportunity for bottom up costing analysis thereby facilitating medical

audit. But whether it enhances quality of care or not is a matter of further discussion [2,12,14].

The general format of critical pathway guidelines is the Gantt chart, which outlines the suggested patient care process based on a time-task matrix. Preparation of multidisciplinary documents, arrange for meetings to facilitate the exchange of opinions about patient care by different professionals, giving a common "game plan" for all hospital staff to view and understand their various roles in the overall care process, defining standards for the expected duration of hospital stay and for the use of tests and treatments, conducting periodic reviews to monitor some defined indicators, selecting a "best practice style", providing a framework for collecting data on the care process so that providers can learn how often and why patients do not follow an expected course during their hospitalization, and finally improving patient satisfaction with care by educating patients and their families about the plan of care are some of the strategic points for successful implementation of critical care pathways[3,4,12].

Development and implementation of Critical Pathways

In hospitals with large patient capacities, equipped with expensive diagnostic and therapeutic techniques, where complex surgical procedures like coronary artery bypass, total hip replacement or obstetric procedures like normal vaginal delivery or cesarean sections are frequently carried out; such hospitals demands the implementation of critical care pathways. In such medical institutions dealing with patients with multiple problems the care process greatly varies from patient to patient. Many institutions have reported the failure of such pathways but still these pathways have been found to be successful in emergency medical diagnoses such as myocardial infarction, stroke, and deep venous thrombosis [1-3].

For successful implementation of critical pathway it is necessary to create a multidisciplinary team in order to view the care process in its entirety. The multidisciplinary team should consist of a hospital administrator, a house staff physician, a member of the quality management department who has expertise in critical pathway methods, and a community-based primary care physician whose perspective regarding inpatient care is likely to differ from that of hospital based physicians. Active participations by physician –experts can successfully drive the pathways; many critical pathways with proper physician involvement ended up in a unsuccessful manner. It is an important challenge for every team member to play their individual expertised role for the success of the pathway [4-5].

Implementation of care pathways can be divided into four phases like: Selection, Development, Implementation and Evaluation. In the selection phase certain selection criteria are chosen in order to standardize the care procedures with an expected clinical course. Firstly, commitment and leadership from top managers (CEO, Medical and Nursing Managers) and a good communication from top to bottom is the prime requisite for the successful implementation of the pathway. A planned financial investment is also required for the success. Next point is multidisciplinary staff implementation, giving the hospital staff good training and education right from the beginning, motivation of the staff, and the economic incentives for staff in order to start a new organizational culture. Use of evidence-based medicine, recommendations of good professional practices and professional references are other important criteria [2,3,5]. The goals of the developmental phase are the constitution of a multidisciplinary team as a 'Care Pathway Committee' and the design of all the documents for a specific care pathway. Formation of care pathway committee, agenda of meetings with the care pathway committee, initial risk assessment by hospital managers, defining the objectives of care pathway, inclusion-exclusion criteria, clinical audit with retrospective data are some of the essential requisites at this stage. The pathway is implemented in the implementation phase which requires the approval and documentation by the medical and nursing managers and the multidisciplinary team. For the development of implementation plan appointment of responsible persons for each care pathway, their proper training and education, new pre implementation risk assessment, review of new documentation after its pilot phase followed by official start of the care pathway after such review process are the important works to be completed under this phase. Though in most hospitals across the world care pathways are managed on paper but electronic pathways or e-pathways have been introduced in many hospitals, e-pathways with the integration of software on common hospital information systems are the driving force of success of such care pathways but implementation success lies on design changes in selective non-specific situations. The last phase of evaluation recommends the participation of professionals from both medical and nursing fields for the compliance of pathways, monitoring of variances, analyzing of impacts, development of systemic ongoing audits, fixing dates of periodic reviews, providing feedbacks to managers and incentives to staff to continue their participation in care pathways [3,5].

Timelines management or dashboard management is an important criterion of critical pathways. Dashboard reports help in continuous tracking of all health care management key performance indicators (KPI's) and being highly focused and effective saves considerable time and money. Health care management or hospital administrator needs to maintain a dashboard displaying certain key performance indicators which helps to facilitate the administrative process. Patient safety, satisfaction, average length of stay, admission rate and admission cancellation rate, re-admissions, number of visitors, specialists, capacity utilization for OT, CT-scan, MRI, USG, list of health checkups, surgeries are some of the important parameters

to be highlighted in the dashboard of health care management or hospital managers. Nursing managers also need to maintain a dashboard focusing on the total number of admissions or discharges, patient care hours, their length of stay etc all of which will directly or indirectly help in successful implementation of critical pathways [14,15].

Stroke Care Pathways

Stroke care pathways have the potential to promote organized and efficient patient care though there is currently insufficient supporting evidence to justify the routine implementation of care pathways for acute stroke management or stroke rehabilitation [14,15]. Many researches and reviews have pointed that implementation of stroke care pathways have both positive and negative impacts and the effects of using care pathways to manage people admitted to hospital with stroke are not clear. Clinical guidelines for acute stroke and stroke rehabilitation and recovery suggest the development of a multidisciplinary stroke care team with health professionals and design of protocols both at local level and at micro levels of clinical pathways for the purpose of acute care [16]. Such guidelines suggest a stroke care pathway for health care professionals which can proceed through the following steps:

- Patient with stroke is transported to the stroke care unit with the assistance of stroke care team and the case should be considered as medical emergency.
- On confirmation of stroke after medical diagnosis acute therapies to be administered appropriately.
- Multidisciplinary assessment will be carried out by specialized stroke team, prevention of any further complications and adoption of early secondary prevention.
- Future care plan should be determined in consultation with doctors and the stroke care team, patient and the family of the patient be properly instructed for further modifications on discharge.

Stroke cases should be considered as cases of medical emergency; immediate diagnosis and management at onset of stroke can reduce the risk factors. Administration of tissue plasminogen activator (t-PA) should be done only in stroke's unit, in cases where strokes units are not available the patients should be transported to nearby hospitals as early as possible [14]. Care pathways are structured care plans used by a multidisciplinary team and are usually implemented to manage more than one aspect of patient care relating to diagnosis, investigation, and acute stroke treatment. Many hospitals have adopted this care pathway as one of the components of a continuous quality improvement scheme, with an aim to improve the quality of stroke care, reduce variations of standards, minimize resource utilization, and educate health care staff [16,17,18,19].

Literature review with different randomized and non-randomized control studies which compared care pathway care with standard medical care didn't provide any concrete evidence that care pathway care provided significant additional benefit over standard medical care in terms of major clinical outcomes like death or discharge destination. There are also weak evidences that care pathway might be associated with fewer urinary tract infections and re-admissions, and more comprehensive use of CT- brain scans. The impact of care pathway care on length of stay and hospitalization costs remains unclear, and more detailed research in this area might be helpful[16,20].

Another group of research findings highlighted that care in a hospital stroke unit can reduce the risks of death and disability after stroke. Care pathways aim to promote organized and efficient patient care based on the best evidence and guidelines. It has been found that patients treated within a care pathway may be less likely to suffer from complications like urinary infections, and more likely to have certain tests like brain scans [16,21,22].

No clear evidences however say that organized inpatient stroke care lead to improved outcome. The role of intensive monitoring units remains unclear as data's do not reveal any significant difference in rates of death or dependency in units with semi-intensive monitoring compared with those without. No difference was seen in death or dependency between mobile inpatient stroke teams and general medical ward care, although people cared for by mobile stroke units fared worse than those cared for on a dedicated stroke unit. However, overall duration of stay in the stroke unit was significantly shorter than in a non-stroke unit setting. In an attempt to explain the reasons for improved outcome on dedicated stroke units, further analysis and systematic reviews showed an increase in the use of oxygen, intravenous saline solutions, and antipyretics, and measures to prevent aspiration on stroke units in comparison to conventional care units might have been responsible[16,20,23,24].

An analysis of data from randomized clinical studies on complications following the initial stroke showed significantly fewer incidences of chest infections, other infections, falls, pressure sores, and stroke recurrences were recorded in the stroke unit patients. But significant differences relating to physiological complications like high or low blood pressure, hyperglycemia, hypoxia, or pyrexia are not recorded. However, the use of care pathways may also reduce the patient's likelihood of functioning independently when discharged from hospital, their quality of life, and their satisfaction with hospital care. Further research is needed to find out the potentiality behind introduction of care pathways for stroke care-management [16,20,22,24].

Clinical Decision Making

Clinical decision making, also referred to as clinical reasoning or judgement, clinical inference or diagnostic reasoning is an important parameter in hospital management. Psychologists have highlighted various theoretical frameworks explaining the behaviours involved in the decision-making process [25,26]. Decision making can be divided into three categories, namely normative, descriptive and prescriptive. Researchers have identified the differences in each category. Normative theories stresses on the decisions taken by a logical rational individual who concentrates on the good decision making process in a realistic world and also focuses on the outcomes of that decision [27]. Descriptive theories concentrates on the decision making process and the ways of reaching such a decision. Prescriptive theories however try to improve the individual's decisions by looking at how decisions are made by understanding how a decision is formulated [28,29].

Traditionally it was the medical professionals who took a main role in clinical decision-making but with the passage of time it was introduced that in a multidisciplinary team there should be divisions of labour and professional barriers should be removed to some extent; then the knowledge and skills of the nurses and midwives were also given importance in clinical decision making. The basic reason behind such removal of barriers or giving independence in clinical decision making is to motivate all other health care professionals to work and become key contributors to the overall effectiveness of the health care team [30].

Health care/ICP in Indian Hospitals

Reviews and researches have pointed out that the Indian health care system has undergone a metamorphosis by increased and focused applications and investments in IT. In the last couple of years IT has been introduced in the Indian healthcare systems [31,32]. In India, it is estimated that IT spent on healthcare will reach $315 million (Rs 1,260 crores) by 2011. The current IT spending estimates are below $ 8,000 (Rs 3.2 lakhs) per hospital in India, Hospitals like Sri Sathya Sai Institute of Higher Medical Sciences, Christian Medical College Vellore, Amrita Institute of Medical Sciences, Fortis Healthcare, Kovai Medical Center Coimbatore; Max Hospitals, Apollo Hospitals, Manipal Hospital, Sankara Nethralaya and Aravind Eye Hospital are said to be the forerunners in adopting IT in India. Apollo Hospitals planned to integrate their information systems across their network of 42 hospitals. Pune based (RHC) Ruby Hall Clinic adopted the IT infrastructure in the hospitals so as to excel in the areas of hardware, enterprise application software and networking. HIS, RIS, PACS, EMR, ERP and telemedicine solution are some of the IT solutions adopted by RHC over a period of eight years [32,33]. Another corporate health care unit, the Fortis Healthcare is utilizing a mobile-cum-wireless communication framework to contact with the nurses, doctors and patients. Care pathways and treatment plans are already being incorporated in the healthcare IT at hospitals in the western world and have yielded rich returns. Data on the implementation and outcomes of care pathways in Indian hospitals is insufficient to draw any conclusion in this regard. IT adoption in the healthcare industry helps to improve quality of care, reduce costs and increases access to healthcare, prevents medication errors. IT can guide a physician electronically to know immediately if the prescribed medication counteracts with another drug that the patient is already taking or if wrong dosages were mistakenly prescribed [32].

Indian medical talent, specialist doctors and surgeons have the capability to compete at international level with some of the world's best hospitals for treating challenging diseases and surgical cases. Even the Indian government hospitals in their deplorable states have produced some of India's finest physicians and surgeons. The Indian hospital system though provides treatment at comparatively low costs and government hospitals are largely free but suffer from poor hospital infrastructure, insufficient medical care, overworked doctors, uncoordinated paramedical staff, and lack of proper nursing care and obviously can't gain patient satisfaction in most of the cases. Despite successive five year plans, not much has changed in the public hospital system. Unsuccessful adoption of IT in some hospitals, shared diagnostic services, inadequate environmental controls, poor patient isolation systems, low budgetary allocations and burdened by growing population, Intensive care units not designed as per specifications Indian hospitals have to go a long way forward before they match with the best in the world's renowned medical institutions in terms of hospital infrastructure, medical skills, nursing care and patient satisfaction [33,34]. Though some great hospitals in the private sectors have been set up by industrialists and philanthropists, but it accounts to only less than 2% and the ultimate scenario of the Indian hospital system reflects inadequate infrastructure and overworked doctors, insufficient nursing and uninsured patient population. The better known hospitals face severe patient and caretaker overload while ordinary hospitals lack the fundamentals of standard medical care. Many large hospitals have failed in successful implementation of information technology to improve their operational excellence and customer satisfaction [34].

A world-class hospital system should have the facilities to meet the requirements from pediatrics to geriatrics, from initial birth to terminal illness, be provided with a combinatorial arrangement not only to treat the suffering patients but also promote their well being, it should have an educational and social infrastructure so that the model hospital can act as an hub for medical treatment, tourism and development [33,34,35].

CONCLUSION

Researches and qualitative reports have shown mixed experiences as regards the implementation of critical pathways. Critical pathway should stress upon standardization in order to improve quality and efficiency; be targeted to improve control over patient care rather than only concentrating how to control expenditures and proper use of resources [1,5]. For the successful implementation of care pathways in the health care system, a matter to be considered in the future is the involvement of patients in the process of designing care pathways since the ultimate goal is enhancing their satisfaction during the care process. The expectations and demands of patients along with other professional goals are to be considered simultaneously. In order to measure the effectiveness of care pathways in reducing costs, one must also measure costs for the entire episode of care. Mere reduction of hospital costs is not the only single goal for critical pathways rather it should give more emphasis to meet the true needs of patients or the improvement in the quality of health care. With its multidisciplinary approach of patient care, cost effectiveness, proper utilization of resources, critical pathways act as a potential tool for quality improvement. However, despite the appealing logic of this approach to quality improvement, several questions remain about the true potentials of critical pathways. Some critics are of opinion that critical pathways can jeopardize research and education in teaching hospitals by undermining experimentation and independent thoughts and creating negative thoughts in the mind of house staff-interns while others have opined that by introducing critical pathways in teaching programs students can be taught about cost effective practice [2,3,5]. According to them critical pathways won't hinder research rather will improve the usual care that is delivered, in many institutions where clinical research studies are going on there patients are considered for clinical research protocols. While future research is pursued, critical pathway programs are in place today, affecting the care of thousands of patients daily. An important current challenge for physicians is to participate in pathway development and implementation so that the management protocols reflect their beliefs about care. Although critical pathways clearly hold the promise of reduced costs and improved quality, the fulfillment of this promise requires the full and informed participation of physicians [3,4,5].

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