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Care pathways for the organization of patients' care

Poti nege za organizacijo nege bolnikov

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Abstract
Care pathways, also known as clinical pathways, critical pathways or integrated care pathways, are used all over the world. Although they are used internationally, numerous misunderstandings still surround them. The goal of this paper is to provide an overview of the history of these pathways, of care pathway development, the effectiveness of care pathways, and of some of the challenges facing current healthcare.
Pathways are more than just a document in the patient record. They are a concept for making patient-focused care operational, and for supporting patient group modelling with different levels of predictability. Care pathways are a method within the field of continuous quality improvement and are used in daily practice as a product in the patient record. This paper explains these different issues.

Key words: patient care, patient safety, organization, clinical pathways

Izvleček
Poti nege, ki jih imenujemo tudi klinične poti, kritične poti ali integrirane klinične poti, se uporabljajo po vsem svetu. Čeprav je njihova uporaba mednarodno zelo

razširjena, pa koncept poti nege še vedno spremljajo številni nesporazumi. V prispevku podajamo zgodovinski pregled poti nege, njihov razvoj in učinkovitost ter nekatere izzive zdravstvenega varstva danes.
Poti niso le dokument v bolnikovem zdravstvenem kartonu, ampak mnogo več. Gre za koncept nege, ki je ciljno usmerjena k bolniku. Hkrati pa tudi pomembno podpira postopke modeliranja skupin bolnikov z različnimi stopnjami predvidljivosti. Poti nege so ena od metod, s katerimi nenehno izboljšujemo kakovost zdravstvenih storitev, v vsakodnevni praksi pa se odražajo v bolnikovem zdravstvenem kartonu. V prispevku opisujemo različne vidike koncepta poti nege.

Ključne besede: nega bolnikov, varnost bolnikov, organizacija, klinične poti

Background

Standardizing care processes is an effective way to improve patient safety and quality of care. One of the main methods used to this purpose is the development and implementation of a care pathway (1, 2). The first systematic use of clinical pathways took place between 1985 and 1987 at the New England Medical Center in Boston (USA) in response to the 1983 introduction of Diagnosis Related Groups (DRGs) (3). Care pathways were introduced to the UK in the early 1990s and consequently their usage spread to the rest of Europe (4). Care pathways were primarily considered to be tools for designing care processes, implementing clinical governance, streamlining delivery of care, improving the quality of clinical care, and ensuring that clinical care is based on the latest research. Nowadays care pathways are used worldwide as one of the methods to structure or design care processes and improve them within the patient-centred care concept. In most countries, the prevalence of pathways is still rather meagre, especially when we consider that the care of 60–80 % of patient groups in general hospitals should be suitable for pathway use (5). When developing pathways for these patient groups, we need to take into account the evidence based key interventions, the interdisciplinary teamwork, the patient involvement, and the available resources (6). This complexity makes it clear that introducing pathways into an organization and developing, implementing, and evaluating individual pathways is a complex intervention. Accordingly, the European Pathway Association (E-P-A, www.E-P-A.org) defines a care 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. Defining characteristics of pathways include: an explicit statement of the goals and key elements of care based on evidence, best practice, and patient expectations; the facilitations of the communication and coordination of roles, and sequencing the activities of the multidisciplinary care team, the patients, and their relatives; the documentation, monitoring, and

evaluation of variances and outcomes; and the identification of relevant resources (7).

Pathway development

Several methods have been used for developing a care pathway. A good synthesis is represented by the 7-phase method (8) that is based on the Deming cycle, better known as the "plan-do-study-act" (PDSA) cycle (9). The 7-phase method aims at offering a systematic approach to support a multidisciplinary team that is developing a new pathway or aims to improve an existing pathway. Although the development, implementation and evaluation of a care pathway can be seen as following on the PDSA cycle, we use the 7-phase method as a series of linked PDSA cycles (see Figure 1). This supports the possibility of "rapid cycle improvement" (comparable to trial and error learning or learning by doing).

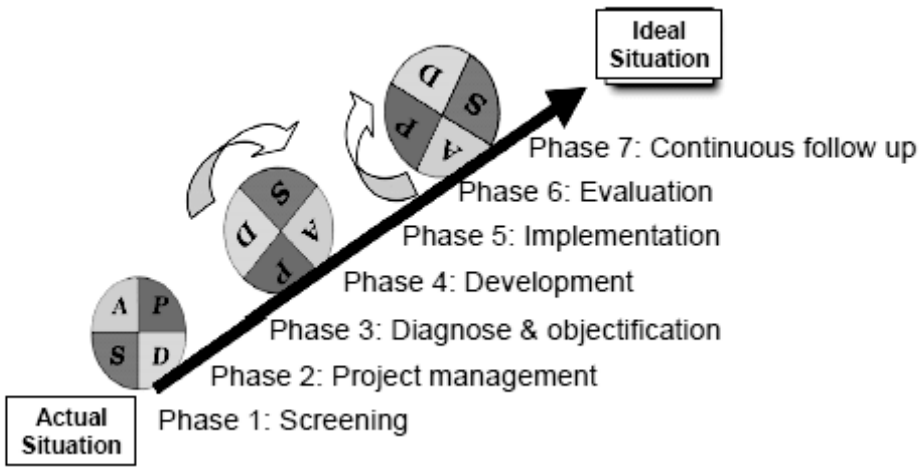

Figure 1. The 7-phase model for development, implementation and evaluation of care pathways. (8)

In Table 1 we describe each phase of the model, including the objective of the phase and the main activities in that phase.

Table 1. The 7-phase model: objective and main activities per phase (8).

Phase	Objective	Activities
Screening	Determine whether a care pathway is the appropriate method to improve the care process	Assemble and analyse information on: - Ownership, teamwork, stakeholders - The actual care process (readily available information)
Project management	- Define the care process for which the care pathway is developed - Assemble the working group / core team	- Define patient group - Define start and endpoint of care pathway - Set up projectplan, incl. milestones
Diagnosis and objectification	Evaluate the current (as is) care process from four perspectives: a. Organization and team b. Patient c. Evidence and legislation d. External partners	Analyse the sequence and timing of the care process from these four perspectives: - Measurements of indicators, questionnaires, process mapping - Patient surveys, interviews, shadowing of walkthroughs - Use of guidelines, clinical algorithms, etc.
Development	Development of the care pathway based on information from the previous phases	- Define inclusion and exclusion criteria for the patient group - Define evidence based key interventions - Practical organization of the care process (resources, staff, training etc.)

Phase	Objective	Activities
Implementation	Prepare the actual implementation, test the pathway and implement the pathway	- Informing and / or training of all team members - Develop implementation plan - Pilot testing of (elements of) the care pathway - Adjusting the care pathway based on the test - Implementation
Evaluation	Determine the effect and usability of the care pathway	- Effect measurement - Measurement of adherence to the pathway - Adjust care pathway if necessary - Develop 'dashboard' for continuous follow up
Continuous follow up	Keeping the pathway alive and up to date	- Use of indicators (dashboard) - Establish ownership - Variance analyses - Every six months substantive discussion in core team - Objective measurement at least once a year

The effectiveness

Since their beginning, care pathways had a tremendous appeal as a potential tool of quality improvement, to the point that hospital leaders concluded that the competitive environment did not allow the luxury of waiting for rigorous tests of the effectiveness of care pathways. (10) Despite the appealing logic of this approach, a healthy skepticism should remain about the pathways' true potential to improve quality. Looking back at the published reviews on the effectiveness of care pathways during the 2007-2012 period, some interesting findings can be observed.

Kwan (11) evaluated 15 pathways for acute stroke care and rehabilitation (3 Randomized Controlled Trials – RCT; N=340 and 12 non-experimental studies; N=4081). With a Cochrane systematic review, it was found that the pathways did not have a significant benefit on functional outcome, and that patient satisfaction and quality of life might actually be worse. On the other hand, a higher proportion,

of patients receiving appropriate investigations, was observed in the pathways group, as well as a lower risk of developing certain complications such as infections and readmissions. The conclusion was that the evidence supported the use of care pathways for acute stroke but not for stroke rehabilitation.

Bailey (11) evaluated pathways for chronic cough in children. The search identified 471 potentially relevant titles but no studies met the criteria for inclusion in the review. Without further available evidence the authors did not make any recommendations for the use of care pathways for the treatment of chronic cough in children.

Lemmens (12) evaluated twenty-three studies regarding care pathways for gastrointestinal surgery, of which 16 were controlled studies. The studies assessed the most frequent complication rates, readmissions, mortality and length of stay and showed how care pathways for gastrointestinal surgery can enhance efficiency of care without any adverse effects on the outcome.

Chudyk (13) analyzed the effect of pathways on hip fracture rehabilitation continuum. According to their findings the adoptation of care pathways increased the use of intensive occupational therapy and/or physiotherapy exercise, enabled earlier surgery and mobilization, had a possible positive impact on functional recovery, decreased the Length of Stay – LOS, increased the appropriateness of the discharge destination for patients, but did not have any significant impact on mortality. Differences were also stronger after accounting for limited pre-existing disabilities and for providing social support among both groups.

Rotter (14) evaluated the use of care pathways for hospitalized children and adults of every age and indication. They selected 17 randomized controlled trials (RCT) and controlled clinical trials, representing 4,070 patients. They observed a significant shortening of LOS (the subgroup-analysis for invasive procedures showed a stronger LOS reduction with weighted mean difference -2.5 days versus -0.8 days). No evidence was found of differences in readmission to hospitals and for in-hospital complications. Four studies showed significantly lower costs for the pathway group.

The meta-analysis of Barbieri (15) evaluated the effect of pathways for hip and knee replacement. Twenty-two studies were included (1 RCT) for a total sample of 6,316 patients. The aggregate overall results showed significantly fewer patients suffering postoperative complications, shorter length of stay, lower costs during hospital stay and no significant differences in discharge to home.

Neuman (16) evaluated the care pathways for hip fracture for a total of 4,637 patients from 9 studies. The results showed lower odds of deep venous thrombosis, pressure ulcer, surgical site infection, and urinary tract infection for patients managed according to clinical pathways versus those receiving the usual care.

The review by Van Herck (17) included 34 of the 4055 publications about the effect of care pathways for total joint arthroplasty. The findings showed that pathways

improved process and financial outcomes, but had mixed effects on clinical outcomes and that the evidence on team and service outcome was lacking.

End-of-life care pathways have been evaluated by Chan, (18) including 920 potentially relevant titles, but no studies met the criteria for inclusion in the review. Therefore it was concluded that without further available evidence, recommendations for the use of end-of-life pathways in caring for the dying cannot be made. Moreover, they remarked how RCTs or other well designed controlled studies are needed for evaluating the use of end-of-life care pathways in caring for people nearing the end of life.

Lodewijckx (19) evaluated the impact of care pathways for in-hospital management of chronic obstructory pulmonary disease – COPD exacerbation. The studies described positive effects on blood sampling, daily weight measurement, arterial blood gas measurement, referral to rehabilitation, feelings of anxiety, length of stay, readmission, and in-hospital mortality. The authors also observed that statistical analyses were rarely performed, and that the trials used highly divergent indicators to evaluate the impact of the care pathways. Therefore, based on these studies, they concluded that the impact of care pathways on COPD exacerbation is inconclusive.

The systematic review on the effect of care pathways for hip fractures by Leigheb (20) assessed a wide range of outcome measures. While a number of divergent clinical outcomes were reported, most studies showed positive results of process management and health services utilization. In terms of mortality, the results provided evidence for a positive impact of care pathways on in-hospital mortality. Most studies also showed a significantly reduced risk of complications, including medical complications, wound infections and pressure sores. Moreover, time-span process measures showed that an improvement in the organization of care was achieved through the use of care pathways. Conflicting results were observed with regard to functional recovery and mobility between patients treated with care pathways compared to usual care.

In conclusion to this section, we have to state that the published effects of care pathways are ambiguous at the least. There are positive as well as negative results in clinical outcomes (e.g. complications, functional status), service outcomes (e.g. patient satisfaction), and financial outcomes (e.g. length of stay). Another important finding in most of the reviews cited above is that the individual studies included in the reviews have a relatively weak design. Therefore, we think that these findings indicate the need for further research; in particular we think that it will be necessary to design stronger research to evalute care pathways. For example, we believe that we could better understand the effectiveness of care pathways by performing cluster randomized controlled trials to evaluate the impact of care pathways on performance of care processes, clinical outcomes, and teamwork when treating patients with different conditions.

New challenges

The rise of chronic diseases represents major challenges for actual health care systems. (2, 21, 22) Most developed countries are facing growing health care costs due to an ageing population in which 70% of health care expenses are related to chronic diseases, (23) while the current fragile economic climate may progressively limit resources available to health care systems. (21) Another challenge lies in the actual organization of health care delivery systems. Current health care delivery systems are often unable to meet the complex needs of chronically ill patients for several reasons. (24) Firstly, health care is traditionally focused on acute care management and short term goals. (24) Secondly, the fragmented delivery of health and social services, including disconnection of primary and secondary care, is an acknowledged problem in many health care systems. (2, 24-26) Thirdly, too often chronic care approaches feature an uninformed, passive patient interacting with a poorly coordinated team of health professionals, resulting in frustrating and inadequate encounters. (27-29) Finally, despite the availability of worldwide evidence-based practice guidelines for a wide range of chronic diseases, the use of evidence based standards remains limited. (2, 21, 30)

A well-established model designed to guide the reorganization of healthcare delivery systems from acute and reactive care to proactive, planned and community-based care, is the Chronic Care Model (CCM) developed by Wagner et al. (1996). (29) In this systemic model, improved functional and clinical outcomes of disease management are the results of productive interactions between informed, activated patients and the prepared, proactive practice team of health care professionals. These productive interactions are supported by six components: health care organization, community resources, self-management support, delivery system design, decision support, and clinical information systems. (24) To better integrate aspects of prevention and health promotion into the CCM, an enhanced version called the Expanded Chronic Care Model was developed by Barr et al. (31)

The CCM has been used widely to guide the reorganization of health care delivery systems, however, implementation has been shown to be fragmented and limited to one or two components, mostly self-management, multidisciplinary teamwork and information systems. (13, 14) This defragmented and limited implementation may explain today's poor integration of care across organizations, the unbalanced skill mix and the lack of patient involvement in the current health care delivery systems. Furthermore, practices and changes in strategies used to reorganize health care according to CCM delivery systems vary significantly across health care systems. (32-34)

A possible strategy to facilitate the integration of all CCM components is the implementation of a care pathway. (21, 35) A care pathway bridging the gap between primary care and hospitals, that allows multidisciplinary teams to interact

with active patients and communities, and which is facilitated by information technologies, can encounter defragemented implementation of the CCM, and has an enormous potential in optimizing patient care and outcomes such as hospital admissions and quality of life. (21, 35, 36) As it has been mentioned before, the impact of care pathways on compliance to care processes and performance of outcomes is already being extensively evaluated for acute in-hospital setting. (14, 29, 37, 38) However, the focus of chronic care needs to shift towards addressing people in all stages of chronic disorders, including the early stages, and managing stable and long-term conditions. To develop an effective care pathway incorporating preventive, acute and long-term care, we need to know which components, and more specifically which best practices are essential for the proper functioning and effectiveness of that care pathway. (35, 39, 40) However, as addressed earlier, due to de-fragmented and diverse CCM implementation strategies, and the use of diverse outcome measures, we can not know the active essential components and practices necessary to develop a structure for these integrated chronic care pathways. For this reason we think that some areas of research should be included in the agenda for further challenges in care pathways.

First it will be necessary to identify the best practices describing “coordination of care across organizations and across boundaries”. This will facilitate the shift from hospital-centred systems towards integrated care systems, including managed clinical networks, multidisciplinary teams and collaborative flexible shared-care arrangements between primary care and hospitals, and across the lines of healthcare believed to reduce inequalities and enhance equitable access to high quality and safe care.

We then believe it will be necessary to develop best practices on “knowledge translation into practice” and “clinical information systems” that will promote evidence-based policy-making and decision making, supported by adequate health information systems. This will probably also promote the use of modern technology (such as smart phones and applications) and will improve patient access, information and disease monitoring, which is expected to lead to cost savings.

Finally, action should focus on insights to cost information, which should help governments to allocate budgets for healthcare more efficiently.

In conclusion we believe that a new care pathway model including best practices is necessary for the reorganization of chronic care according to CCM. Such reorganization is necessary to deal with the current challenges of the growing rise in chronic diseases, the ageing population and the inevitable shift from hospital-centred medicine to home care, and from physician care to nurse care and self-management.

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