Chapter 1

What about care pathways?

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Introduction

Porter et al. (1) stated that healthcare should change and that the purpose of healthcare systems is not to minimize costs but to deliver value for patients, which in the long run results in better health per dollar spent. Three principles should guide this change: (i) delivering value to patients, (ii) medical practice should be organized around medical conditions and care cycles, and (iii) results—risk adjusted outcomes and costs—must be measured. With respect to this change, the role of the multidisciplinary team is to focus on the clinical process innovation (CPI) (2). CPIs are central to the ability of organizations to negotiate the challenges of cost containment and quality improvement, yet many CPIs have not met expectations to improve these primary processes (2). Well organized care processes, medical conditions, or care cycles lead to appropriate outcomes if they include a structured context and a well-functioning multidisciplinary team (3).

Patient safety, quality of care, and efficiency of healthcare procedures are international phenomena. In 1991, Brennan et al. (4) concluded that a substantial amount of injury to patients occurs due to healthcare management and that many injuries result from substandard care processes. One of the most cited reports on this topic was published by Kohn and colleagues of the Institute of Medicine (IOM): To err is human (5). Later, other authors from all over the world published similar results on adverse events. The first and fundamental ethical principle in healthcare—do no harm—is now being taken seriously by a wide constituency. Five years after the IOM report, in 2004 Altman et al. (6) concluded that many promising efforts have been launched, but the task is far from complete.

Although adverse events are not uncommon in hospitalized patients, they are by no means inevitable (7). Even if a direct relationship is difficult to establish between variations and errors, reducing variations by standardizing clinical processes is an effective tool to minimize the probability of medical errors (5).
Improvement in healthcare requires the active participation of not only the physicians but of all healthcare workers. Recently, Batalden and Davidoff stated, ‘Everyone in healthcare really has two jobs when they come to work every day: to do their work and to improve it!’ (8).

The pathway history and definition

Healthcare is changing towards more patient focused care. The organization of the care process related to quality, efficiency, and accessibility will be one of the main areas of interest over the next few years for clinicians, healthcare managers, and policy makers. One of the main methods used to (re)organize a care process is the development and implementation of a care pathway. Care pathways, also known as clinical pathways, integrated care pathways, or critical pathways, are used worldwide for a variety of patient groups (9). They originate from industrial processes and were introduced in healthcare in the early 1980s in the United States (10). The development, implementation, and evaluation of clinical pathways represents one of the structured care methodologies next to, for example, guidelines, protocols, and case management. Clinical pathways are nowadays being implemented, as a method for monitoring processes and processing time, in a wide range of healthcare systems, primarily to improve the efficiency of hospital care while maintaining or improving quality. 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) (11). Typically, a reference length-of-stay (LOS) and a budget are assigned to each DRG. In the late 1990s, more than 80% of US hospitals used at least some pathways. In the UK, pathways were introduced in the early 1990s (11). Clinical pathways, or integrated care pathways (ICPs) as they are called in the UK, are primarily considered to be tools for designing care processes, implementing clinical governance, streamlining delivered care, improving the quality of clinical care, and ensuring that clinical care is based on the latest research. From the late 1990s towards the beginning of the 21st century, clinical pathways were disseminated all over the world (11,12). Nowadays clinical pathways are used worldwide as one of the tools 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 one considers the idea that the care of 60–80% of patient groups in general hospitals should be suitable for pathway use (12). When developing the pathway for these patient groups, one needs to take the evidence based key interventions, the interdisciplinary teamwork, the patient involvement, and the available resources into account (13). This complexity makes it clear that introducing pathways into an organization and
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developing, implementing, and evaluating individual pathways is a complex intervention.

Accordingly, the European Pathway Association (EPA) 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 includes: 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, patients, and their relatives; the documentation, monitoring, and evaluation of variances and outcomes; and the identification of relevant resources (9).

A care pathway is not defined as a document or a tool but as a ‘complex intervention’ (9,14–17). The Medical Research Council states that complex interventions in healthcare, whether therapeutic or preventative, comprise a number of separate elements which seem essential to the proper functioning of the intervention although the ‘active component’ of the intervention that is effective, is difficult to specify (15). If we were to consider a randomized controlled trial of a drug versus a placebo as being at the one end of the spectrum, then we might see a comparison of a stroke unit to traditional care as being at the most complex other end of the spectrum. The greater the difficulty in defining precisely what exactly the ‘active component’ of an intervention is, and how they relate to each other, the greater the likelihood that you are dealing with a complex intervention (15). Pathways show greater similarity to the complexity of stroke units than to the simplicity of giving a single drug. When developing and implementing a care pathway, part of the active ingredients of the complex intervention are the multidisciplinary teamwork, understanding the practical organization of care and the integration of a set of evidence based key interventions and outcomes.

Because of this complexity it becomes clear that pathways are more than only a piece of paper or a file in the patient record (18). Care pathways are a concept to introduce patient focused care, different models of pathways exist, they are a methodology to support the quality and efficiency improvement process and are made operational on different aggregation levels.

Pathways as a concept, model, process, and product

The concept to introduce patient focused care

The goal of care pathways is to introduce and operationalize the patient focused care concept. Although ‘patient focused care’ can be found in nearly every mission statement of a hospital, rehabilitation centre or primary care organization,
it is not always put into practice. The patient focused concept asks for real patient focused care, which means a disease specific orientation and the involvement of patients as real partners (19). More and more hospitals are now changing towards service line organizations where the patient group is a key unit of organization. The Institute of Medicine stated in their publication, *Crossing the Quality Chasm* (2001) (3), one of the first steps to enhance the quality and safety of healthcare organizations:

Organize and Coordinate Care Around Patient Needs. The primary purpose of identifying priority conditions is to facilitate the organization of care around the patient’s perspective and needs rather than, as in the current system, around types of professionals and organizations (3,19).

Degeling describes the relation between medicine, management, and modernization as ‘a dance macabre’. He argues that pathways can help in the integration of the different professional groups because in this model the patient group is the central focus (20). Next to this disease specific orientation, seeing patients as real partners will become even more important. ‘Every patient is unique, so deal with their needs as they come up and move them onto the next step’. This is one of the traditional rules to provide access to health care as described by Rogers et al. (2008) (21). The new rule will be that every patient is unique, but they share enough in common that care pathways are a useful norm, and patients and clinicians are able to make choices that differ from these pathways as needed (19,21). To protect pathways against this fear and to build patient centred pathways we need to involve patients as real partners in the development process. Wensing and Elwyn (2003) provide an interesting overview of different methods to incorporate patient’s views in healthcare (22). Although patient satisfaction questionnaires are one of the most widely used tools, more in depth methods could be suggested for pathway projects. Open interviews with patients and relatives or performing walkthroughs together with a patient or by a clinician as a mystery patient will provide useful information for the pathway development team (19).

**Different models of care pathways exist**

Care pathways are a model to standardize and follow-up patient focused care. They combine a variety of methods from quality improvement and operational research used in industry and healthcare. When using or translating these methods, two issues are important: the level of predictability of the care process and the level of agreement between the members of the multidisciplinary team (23). Based on these two issues, three different coordination mechanisms can be described: chain models, hub models, and web models (see Figure 1.1) (24).
Chain models are used for high predictability care processes with a high level of agreement between the team members. This mechanism is found for example in elective surgery or chemotherapy processes. For these processes pathways can be used as time-task matrixes, also called Gantt Charts. The sequence of the timing will mostly be day by day. For some more critical care processes, half days or hour by hour will be used to describe the timing of the process.

Hub models are used for less predictable processes like internal medicine, rehabilitation, psychiatry and palliative care. In these models a key person, or case manager, will lead the organization of the care process and can use chain models for the high predictability sub-processes.

Web models are used for unpredictable care or care processes wherein it is necessary to have daily team meetings to be able to organize and structure the process (24). In web models the time-task matrix can be changed into a goal-task matrix. If the time sequence is kept, the day sequence can be changed in weeks. Examples are: complex diagnostic admissions or pathways for patient groups with several important co-morbidities.

One of the goals of each of these models is to enhance the interdisciplinary teamwork (24). The importance of appropriate teamwork cannot be underestimated. Gittel (2000) analysed the relation between good teamwork and patient outcomes and found positive results (25). Vanhaeckt et al. found similar results in 2007 (9,26). As already described in a previous section of the chapter (see pathways as a process) the team needs to develop the pathway taking the content and organization into account. Care pathways are, as stated in
the definition, interdisciplinary. Different professional groups (doctors, nurses, allied health professionals, etc) need to interact and decide how they will organize the care process and who is responsible and will take the lead for each part. How this challenge is managed will also depend on the level of agreement and predictability as described above (see Figure 1.1).

Chilingerian and Clavin (1994) describe the concept of temporary teams, in which a temporary team is formed for every patient, under the supervision of the clinical lead (medical doctor) and the team members are detached from their own professional group or service (27). When structures are built around these temporary teams and specific resources are invested, the temporary teams may become focused teams (stroke team, total knee team, palliative care team . . .) (28). The interdisciplinary pathway team needs to focus on common goals, describe the different roles of the team members and the communication and coordination mechanisms and processes which will be used. Nelson & Batalden describe clinical microsystems (29). A clinical microsystem is a small, interdependent group of people who work together regularly to provide care for specific groups of patients. This small group is often embedded in a larger organization. Formed around a common purpose or need, these groups may comprise discrete units of care, such as a neonatal intensive care unit or a spine centre. A general clinical microsystem includes, in addition to doctors and nurses, other clinicians, some administrative support and a small population of patients, with information and information technology as critical ‘participants’ (29). Within a care pathway different clinical microsystems can be defined. The number of people within each microsystem or the number of microsystems within each organization or pathway will differ from organization to organization and model to model (see Figure 1.1) (24).

The quality and efficiency improvement process

Care pathways are also a process on their own to develop and implement well organized care and to improve quality and efficiency (9,18,30). In literature different methodologies are described but basic principles are found in all appropriate methodologies (12,23,31). Active ingredients of the complex care pathway intervention are: the feedback on the actual organization of the care process; the availability of evidence based key interventions and outcome indicators; and the continuous quality and efficiency improvement process which takes place within the multidisciplinary team. Recent multicentre research has shown that during the pathway development, even before the implementation of the pathway, the organization of the care process can be improved (9,26). Over time the team will improve the quality and efficiency of the care process by analysing the actual organization and performance of the care process.
Based on the bottlenecks the team will improve the process by using the plan-do-study-act cycle for continuous improvement with respect to patient characteristics and expectations (9,32). The changes in the organization of the care process are standardized by implementing the pathway product (see Figure 1.2) (9).

To improve the organization, the involvement of the multidisciplinary team will be necessary. Enhancing teamwork is seen as one of the main processes that lead to the improvement of care pathway outcomes. The development of a pathway asks for real teamwork (19). ‘Pathways make teams work’ is one of the quotes often used during pathway conferences and even in literature. The impact of care pathways on the multidisciplinary teamwork is described in vast amounts of literature but there is a lack of hard evidence on this management issue and it is time to find out what the impact of pathways on teamwork really is. Recently Bates et al. published a list of global priorities in patient safety research (33). When they considered the developed countries, the most important area for research was the lack of coordination and communication, followed by latent organizational failures, poor safety culture, and blame oriented processes (33). A study on the impact of clinical pathways on the organization of care processes (26) revealed that teams who have a pathway to support the care process have significantly higher scores on the coordination of the care process than teams not using pathways (odds ratio 8.92

Clinical/Care Pathway as Continuous Care Process Improvement Intervention

![Diagram](Fig. 1.2 The pathway continuous quality and improvement process (9).)
(CI 1.52–95.38) (9,26). Also on the follow-up of the care process a significant odds ratio of 5.56 (CI 1.80–20.36) was found (9). On the overall organization of the care process, measured with the Care Process Self Evaluation Tool (CPSET) (34), a odds ratio of 4.26 (CI 1.40–13.61) in the benefit of pathways was found (9,26). A multicentre study on joint arthroplasty patients, including 39 care processes and 737 consecutive patients, revealed the statistical interaction effect between pathways and the coordination of the care process as determinants for length of stay and elapsed time to discharge (9). Most of these effects are seen in observational studies. Additional research will be necessary to prove the relation between pathways and coordination. The European Pathway Association is currently organizing an international cluster randomized controlled trial on chronic obstructive pulmonary disease and proximal femur fracture patients to explore the impact of pathways on these two patient groups. One of the focuses in these trials is the impact of pathways on the multidisciplinary teamwork (35,36).

One of the most important pitfalls in pathway development from a clinical point of view is the absence or lack of evidence based key interventions and outcome indicators (13,19). During the pathway development process the team needs to review the available literature on the specific clinical topic. Although this can be a very time consuming process it is one of the most important challenges for the future (19). Pathways are used to standardize outcome oriented care, but the content of the pathways is not always clear and is frequently vaguely described in pathway literature. Pathway appraisal instruments describe the development of the pathway, the organization of the care process or the pathway document, but they rarely evaluate the content of the path (18). This problem does not only occur in the field of care pathways but also within the area of clinical guidelines, where the AGREE instrument also does not evaluate the content of the guidelines (37).

One of the possible reasons why some pathways do not lead to an improvement in quality and/or efficiency is the quality of the content. Therefore references to the literature and guidelines should be used in pathways. Websites like www.guideline.gov are ideal as a starting point. Google www.google.com—although widely used—is not the most appropriate search engine to support evidence based pathways. More evidence based pathways require evidence based key interventions and indicators to follow-up the quality and efficiency. Recently the National Health Service in the United Kingdom has made the Map of Medicine available to clinicians. The Map of Medicine (www.mapofmedicine.com) is a visualization of the ideal, evidence based patient journey for common and important conditions that can be shared across all care settings. The Map is a web-based tool that can help drive clinical consensus to
improve quality and safety in any healthcare organization. These Maps, updated every six months, are the start to develop an evidence based pathway. In the Maps the key interventions are described and references to the guidelines and the overall available literature are made available. Pathways can be one of the tools to organize daily clinical practice, based on the evidence based content of the Map.

Next to the Map of Medicine the British Medical Journal Group also provides Action Sets which are detailed overviews of the evidence based content for several care processes. Action Sets from the BMJ Evidence Centre pre-define the appropriate diagnostic and treatment orders for a range of common conditions, and can incorporate contextual patient information, local customization and even clinician personalization. They bring critical information from Best Practice, BMJ Point of Care, and Clinical Evidence into the heart of the clinical workflow (http://group.bmj.com/products/evidence-centre) (19).

Secondly, evidence based indicators need to be used in the pathways. To develop a pathway is one challenge but to keep pathways alive is a very difficult exercise. To keep pathways alive clinicians, managers, and patients should be frequently provided with hard data on outcomes. A framework for pathway indicators is the Leuven Clinical Pathway Compass in which the five domains are defined: clinical indicators, process indicators, financial indicators, team indicators, and service indicators (38). Pathway facilitators could use the indicator clearing house (comparable to the guideline clearing house) www.qualitymeasures.ahrq.gov and the template of the Agency for Healthcare Research and Quality www.ahrq.gov to define each indicator. For each indicator the relationship to quality, the benchmark, the definition, the numerator, the denominator, and the type of indicator is described. Also the inclusion and exclusion criteria are important to understand and benchmark the data. Enhancing the level of evidence of the key interventions and outcome indicators should improve the outcome of care. Teams should not forget to include, next to the evidence from literature and clinical research, evidence based on the competence of the team, operational research, and from patient involvement (9,22,24).

The pathway product has four aggregation levels

Next to pathways as a concept, a process, and a method, we have to describe pathways as a product. The pathway product is of course an important item but without the pathway concept, process, and method, the product is worth nothing. This means that buying pathways without translating them and adapting them to the specific organization and team could be unsafe and ineffective. The pathway product is mostly seen as a file in the patient record. Although this
patient record is mostly paper-based more and more examples can be found of electronic supported pathways (39). Four types or levels of aggregation or pathway products can be described: the model pathway, the operational pathway, the assigned pathway, the completed pathway. The patient version of the pathway encompasses the operational, assigned, and completed pathways. (24). See Figure 1.3.

The model pathway is the most aggregated level. This pathway is based on the available international and national evidence. It is not organization specific. The operational pathway is the pathway that is developed by a specific organization taking into account the information from the model pathway and the characteristics from the specific organization (available competencies, resources . . .). This pathway is organization specific because of the differences between different organizations. The assigned pathway is the pathway that is used for a specific patient and is the pathway that is based on the operational pathway and adapted to the needs of a specific individual patient. The completed pathway is the path that can be reviewed *ex post facto*, after the discharge of the patient. The difference between the completed pathway and the operational pathway provides information about the variances and the level of compliance to the key interventions in the path (30). Based on this information the pathway can be revised and further improved. A last type of pathway is the patient version of the pathway to inform and involve the patient and family about the process of care. Most of the time the patient version is based on the model and operational pathway (9,13,24).

![Fig. 1.3 Four aggregation levels of the pathway product (24).](image-url)
Discussion and challenges for palliative care

Pathways are complex interventions that are more than a piece of paper. They are developed by a multidisciplinary team of clinicians and managers and need to be based on the latest evidence from the literature, operational research, and patient involvement methodologies. Pathways are not something you develop overnight. In palliative care the complex intervention will include the key clinical interventions with a focus on the clinical quality and of course room for caring and supporting activities. The different medical, nursing, spiritual, and allied health professionals need to be part of the development team. Family members should be part of this team and could support the clinicians in the continuous quality and efficiency improvement process.

Pathways need to be developed and implemented with the patient focused care paradigm as the main driver. Different models of pathways can be implemented based on the level of predictability of the care process and the level of agreement within the team. In palliative care a combination of chain, hub, and web models will be found. The model used, will change over time between the palliative diagnosis and the final days, mainly based on the predictability of the process.

Evidence based key interventions and outcome indicators are an important and difficult issue within palliative care. Discussions between the importance of clinical activities or the issue that supporting care is more important will remain a central issue. All interventions in the pathway—clinical, caring, spiritual, supporting, etc—need to be discussed among the different team members so that they lead to shared goals, clear roles, and understandable communication and coordination procedures. Only in this way can the team become a high performance team.

Next to the relation between the professional team and the individual patient, special attention needs to be given to the patient’s family. A patient and family version of the pathway, based on the model and operational pathway should be an important by-product for palliative care pathways.

The Liverpool Care Pathway for the Dying Patient (LCP) (40) is a unique example of a model pathway that can be translated and implemented in different organizations all over the world. The work of the Liverpool team, under the supervision and leadership of Professor John Ellershaw, opens up the discussion on how organization specific pathways are. The fact that this pathway is used in different types of organizations, on different continents with different cultures, professionals, competencies, and interests; inspires other clinicians and international networking associations, like the European Pathway Association, to translate this palliative care know-how for other patient groups.
in different clinical areas. With the development, implementation, and translation of this model pathway for the dying in different cultures and settings, the multidisciplinary team from Liverpool proves that the first and fundamental ethical principle in healthcare—do no harm—must also be taken seriously within the important field of palliative care.

References


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