Clinical Pathways as Instruments for Risk and Cost Management in Hospitals - A Discussion Paper

Tobias Romeyke (Corresponding author)
Dept. of Public Health, Information Systems and Health Technology Assessment
UMIT - University for Health Sciences, Medical Informatics and Technology
Opernring 5, A-1010 Vienna, Austria
E-mail: tobias.romeyke@umit.at

Harald Stummer
Dept. of Public Health, Information Systems and Health Technology Assessment
UMIT - University for Health Sciences, Medical Informatics and Technology
Opernring 5, A-1010 Vienna, Austria

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Abstract

Introduction: The distinctive characteristics of the German health system are medical progress and financial pressure—and this is especially true of the hospitals. These challenges must be met by strategic management instruments for quality assurance, and by reducing costs. Purpose: This article presents the instrument “clinical pathway” (also known as “clinical treatment pathway”) and describes the possibilities it offers, both for quality assurance and risk management, and for cost reduction. The clinical pathway presented here will be that for “multimodal pain therapy”, as used in the context of acute inpatient care in Germany. Methods: A general presentation of the risks in hospital is followed by consideration of the risks associated with core processes. A comprehensive total cost analysis is performed for those patients who meet the pathway entry criteria and who fulfil the requirements for the structure of care provided within multimodal pain therapy. Discussion and Conclusion: Multimodal pain therapy places high demands on the structural, procedural and outcome quality of the medical, nursing and therapeutic services provided, and these demands are reflected in high costs for the provision of this care. The treatment process involves many different professional groups. These complex interfaces can potentially generate risks, which can lead to the possibility of legal liability. A clinical pathway must structure the core process and then combine elements of quality assurance in order to optimise patient care and minimise risk. The examination of costs reveals significant potential savings (patients with clinical pathway: EUR 3086±212; patients without clinical pathway: EUR 3774±460; Mann-Whitney U test; p<0.001). For the managers of a hospital, the clinical pathway represents a strategic management instrument that can serve for continual cost control and cost reduction, and can contribute in the form of quality assurance towards a transparent provision of services.

Keywords: Clinical pathway, Quality management, Multimodal pain therapy, Risk management, Cost efficiency, Total cost

1. Introduction

1.1 Clinical Pathways

Health care world-wide presents a challenge regarding its organisation and the efficient allocation of resources. This challenge is increasing as a result of continual progress in the field of medicine and sustained demographic development. The greatest costs in the health system are generated by hospital treatment. The costs for the almost 2,100 hospitals in Germany increased by 6.1% during the year 2009 to reach a total of 77.1 billion euros (Statistisches Bundesamt “Federal Statistics Office”, 2011).
More and more hospitals in Germany are striving to restructure their procedures for providing services in order to generate potential for reducing costs. They are aiming simultaneously to optimise the quality of their processes and outcomes.

To this end, clinical pathways will become increasingly important in the context of case tariff fees as a part of the International Statistical Classification of Diseases and Related Health Problems (ICD) for inpatient hospital services. These pathways will contribute towards shortening the period of hospitalisation (Hommel et al., 2008; Ishiguro et al., 2008), reducing costs (Verdú et al., 2009; Barbieri et al., 2009; Rook 1998; Velasco et al., 1996) and increasing the quality of the services provided (Schwarzbach et al., 2010; Andriessen et al., 2009; Feuth & Claes, 2008). A generally valid definition of “clinical pathway” exists neither in the USA, nor in Australia, nor in Europe. Hindle (1997) defines the clinical pathway as a document describing the services provided in the multidisciplinary treatment of a particular type of patient, which enables comments to be made about deviations from the norm for the purpose of evaluation and improvement.

The development of a clinical path must relate to indications or procedures and, in order to achieve greater efficiency and quality benefits, must cover the patients and cases focused on by the hospital and therefore occurring most frequently. Patients, doctors, nurses and therapeutic personnel must all be involved in the development of a clinical pathway in order to integrate indication-related, evidence-based and best-practice procedures as requirements in the clinical pathway. The present work examines in greater detail the contribution of a clinical pathway with regard to aspects of risk management, quality assurance and cost efficiency for multimodal pain therapy.

1.2 Multimodal Pain Therapy in Germany (OPS 8-918)

Physical pain is not the only symptom suffered by patients subject to chronic pain; at the psychological level, chronic pain is accompanied by a wide variety of cognitive and emotional factors. Patients suffering from chronic pain frequently suffer from accompanying diseases which can be manifested, for example, in the form of states of anxiety and panic, despair, depression and lability (Banks & Kerns 1996; McWilliams et al., 2003). Most chronic pain patients withdraw from their social environment, show less and less interest in social contacts and activities, and become involved in interpersonal conflicts within their family, or among their friends, or colleagues at work (Cowan et al., 1998).

The Deutsche Gesellschaft zum Studium des Schmerzes (DGSS) (“German Society for the Study of Pain”) defines multimodal pain therapy as the “interdisciplinary treatment of patients with chronic pain syndrome in such a way that the different therapies, given simultaneously with mutual coordination of their content, chronology and procedure, are integrated with the different somatic, physical, psychological, occupational and psychotherapeutic methods according to a predefined therapy plan with an identical therapeutic target agreed among the therapists”.

Multimodal pain therapy is listed as Procedure 8-918 in the Operationen- und Prozedurenschlüssel (OPS) (“Operations and Procedures Code”) in the versions published by the Deutschen Institut für Medizinische Dokumentation (“German Institute for Medical Documentation”) at the behest of the Bundesministerium für Gesundheit (“Federal Ministry of Health”) pursuant to §§295 and 301 SGB V (“Social Code”). The acceptance and further development of inpatient multimodal pain therapy within the German case tariff fee system (G-DRG) result from the efforts of a number of professional associations, which include the Deutsche Gesellschaft zum Studium des Schmerzes (DGSS) (“German Society for the Study of Pain”; the Berufsverband Deutscher Anästhesisten (BDA) (“Professional Association of German Anaesthetists”, the Gesellschaft für Anästhesiologie und Intensivmedizin (DGAI) (“Association for Anaesthesiology and Intensive Medicine”), and the Deutsche Interdisziplinäre Vereinigung für Schmerztherapie (DIVS) (“German Interdisciplinary Association for Pain Therapy”). The multimodal pain therapy is used in specialized clinics in Germany.

Multimodal pain therapy in accordance with OPS 8-918 places high demands on the structural, procedural and outcome quality of the provision of inpatient services. The OPS stipulates an interdisciplinary team whose members have specialised in different fields. The therapy manager must be a specialist with an additional qualification in “special pain therapy”. The term special pain therapy requires special knowledge in the areas of conservative medical (eg, internal medicine, neurology, etc.), operative medicine (surgery, neurosurgery, orthopedics, etc.) and conservative and interventional medical (anesthesiology, radiation, etc.). Particular basic knowledge about the pathogenesis, diagnosis and therapy, bio-psycho-social history of pain, mental disorders with pain and psychosomatic interactions in chronic pain states further expertise in neuropathic pain, pain with vascular disease, pain in visceral disease, cancer pain, pain in children and adolescents, muscle pain, back pain, joint disorders. The structural requirements for performing multimodal pain therapy also correspond with the requirements of evidence-based provision of services. According to this, indication-related behavioural therapy
(Chou & Huffman 2007; Gatchel & Rollings, 2008), occupational therapy with movement-therapy approaches (Hayden et al., 2005) and ergotherapeutic methods (Williams et al., 2007) must be integrated in the therapy plan. Ergotherapeutic methods include “joint protection measures”, “learning of substitute functions”, “improving the mobility and locomotion”, “hand therapy”, “training of life skills”.

Depending on the clinical picture, physiotherapeutic measures (Gross et al., 2004), art (Sexton-Radek, 1999) and music therapy (Good et al., 2002; Tan et al., 2010), therapy for workplace training, sensomotoric training, and medical training therapy (Valim et al., 2003) must be prescribed by the medical staff. Therapies for workplace training include for example correct posture, stretching and relaxation exercises at the PC workstation.

The prescribed treatment methods are used depending on the clinical picture. The methods of conventional medicine are transformed into an integrated and holistic approach of therapy.

2. Methods

2.1 Risks in the Provision of Inpatient Services

As a result of legal requirements and the fact that human life is at the focus of the services provided, the risks prevalent in a hospital are particularly diverse. Starting from the general risks in the hospital, attention must be directed towards the procedure-related risks, and approaches to solutions must be worked out for multimodal pain therapy.

2.2 Pathway Entry Criteria

Examination of the pathway entry criteria (Fig. 1) is an integral part of structured admission management, based on which the therapeutic objectives are defined and the pathway sequence is oriented; this, in turn, demands complex interface management.

2.3 Structural Requirements and Provision of Services

The code for multimodal pain therapy stipulates a minimum of seven days interdisciplinary treatment (by legislation) of patients with chronic pain conditions (including tumour pain) with involvement of at least two specialist fields (of which one must be a psychiatric, psychosomatic or psychological discipline). In addition, at least three of the following active therapeutic methods must be used simultaneously: psychotherapy, physiotherapy, relaxation techniques, ergotherapy, medical training therapy, sensomotoric training, workplace training, artistic therapy (art or music therapy) or other kinds of occupational therapy. The therapy sessions last an average of 30 minutes. The code also includes an evaluation of the progression of the treatment by means of a standardised therapeutic assessment, a daily doctor's visit or team discussion, and a weekly interdisciplinary team meeting. In group therapy, the size of the group is limited to a maximum of 8 people. Use of this code requires that the responsible doctor has the additional qualification “special pain therapy” (OPS 8-918; The operations and procedure code (OPS) is published by DIMDI [“German Institute for Medical Documentation”] on behalf of the Federal Ministry of Health).

2.4 Costs Analysis

Based on the path entry criteria (Section 2.2.) and the structural requirements for providing services (Section 2.3.), an analysis was performed of the total costs incurred by 65 subjects who received inpatient treatment in accordance with the requirements of multimodal pain therapy. The costs data were acquired by means of cost type accounting, cost centre accounting by means of cost-centre related cost distribution, and differential in-house performance accounting which localises the places at which costs are incurred. As the final stage of the cost accounting, cost unit accounting identifies the reasons for the costs incurred and allocates the final cost centres to the individual beneficiaries of services.

3. Discussion and Conclusion

3.1 Path-Indicated Quality Assurance and Risk Minimisation

Hospitals are characterised by complex interfaces.

The risks to which a hospital is exposed are extremely complex, at the level of both the control processes and the support processes, and care is essential when examining them (Fig. 3). Control processes in the hospital include strategic management and controlling, and the requirements for internal and external quality assurance. Support processes include financial controlling, materials management and pharmaceutical services.

German legislation ensures greater safeguards for stake- and shareholders in that it defines appropriate standards for issuing early warnings of risks that could lead to the demise of the enterprise. This includes the Gesetz zur Kontrolle und Transparenz im Unternehmensbereich (KonTraG) (“Corporate Sector Supervision and
The resulting transparency for the different providers of services forms the basis for minimisation of treatment. The treatment process is accompanied by complete medical and therapeutic documentation and a variance analysis. Methods of pain therapy must be recorded and discussed during a patient briefing.

In addition, all risks that arise in association with drugs administered for specific kinds of treatment and with and serve at the same time to assure the quality of the process and the outcome. Risk management instruments (drug administration, determination of active and passive therapeutic measures, etc.) and the disease activity score (DAS) is used (Cruyssen et al., 1995) (Fig.2). This disease activity score indicates how high the disease activity is and was developed in Europe as an alternative to the ACR (American College of Rheumatology) criteria. Every diagnostic procedure functions as a quality assurance and risk minimisation, and the monitoring of the therapeutic progression are subject to the subsequent diagnoses and the medication and therapeutic regimen. Both the generation of findings for purposes of quality assurance and risk minimisation, and the monitoring of the therapeutic progression are subject to different score parameters specified according to indication, and these accompany the treatment processes. For example, the clinical pathway for multimodal pain therapy for diseases and disturbances of the musculoskeletal system and connective tissue requires the measurement, several times a day, of the pain intensity by means of the visual analogue scale (VAS) (Winkelmann & Schreiber, 1997), whereas the functional capacity of patients with rheumatic diseases is recorded using the “Hannover Questionnaire” (FFbH) (Kohlmann & Raspe, 1996). The visual analog scale is a semiquantitative procedure for the subjective measurement of pain intensity. 12 statements by the FFbH allows to measure the functional capacity at activities of daily living (mobility, personal hygiene, dressing and undressing) which may be affected by problems in the spine. This instrument, according to Kohlmann and Raspe (1996) already light up moderate functional limitations found in back pain patients. On admission, all aspects of pain occurrence, pain sensitivity, social anamnesis, pain intensity, pain character and pain localisation are evaluated using the pain questionnaire of the DGSS (“German Society for the Study of Pain”). For inflammatory rheumatic diseases, the disease activity score (DAS) is used (Cruyssen et al., 2005; Prevoo et al., 1995) (Fig.2). This disease activity score indicates how high the disease activity is and was developed in Europe as an alternative to the ACR (American College of Rheumatology) criteria. Every diagnostic procedure functions as a risk management instrument (drug administration, determination of active and passive therapeutic measures, etc.) and serves at the same time to assure the quality of the process and the outcome.

In addition, all risks that arise in association with drugs administered for specific kinds of treatment and with methods of pain therapy must be recorded and discussed during a patient briefing. The treatment process is accompanied by complete medical and therapeutic documentation and a variance analysis. The resulting transparency for the different providers of services forms the basis for minimisation of treatment.
risks and poor outcomes, maximisation of internal quality, and compliance with the requirements of quality assurance (Romeyke, 2009).

Figure 5 summarises as a checklist in eleven items the important elements of risk minimisation and quality assurance in pain therapy.

3.2 Generation of Efficiency Potentials

In addition to aspects of risk and quality management, active process management should also take cost aspects into account.

All 65 subjects fulfilled the pathway entry criteria described under 2.2., enabling Procedure 8-918 to be coded correctly in accordance with the requirements of the OPS.

The mean total costs for the 65 patients amounted to EUR 3467.08 (Fig. 6a and 6b). Patients for whom a clinical pathway (CP) was used incurred significantly lower costs than patients without CP (patients with CP: EUR 3086±212; patients without CP: EUR 3774±460; Mann-Whitney U test; p<0.001). This difference can be attributed to the clinical pathway requiring pre-defined, structured admission management with integrated pain anamnesis, the standardised use of evidence-based and best-practice measures, and the avoidance of inappropriate prescriptions. A clinical pathway must be designed so as to guarantee efficient allocation of resources in inpatient care.

3.3 Conclusion

Hospitals in future will have to cope with the fact that under the terms of a case tariff fee system, more cases will have to be treated with the same, or even a reduced, staffing level. It therefore appears necessary to identify and remove existing deficiencies in how procedures are organised. In the context of operative risk management, this must include the analysis, evaluation and monitoring of risks associated with diagnoses and procedures, with the aim of ensuring risk-free provision of services (Erben & Romeike, 2003). For the providers of services at the core process level (medical specialists, nursing staff, therapists and non ward-based nursing staff), clinical pathways will simplify the treatment process, and prevent—or at least minimise—risks by means of structured and comprehensive diagnosis and treatment procedures. Clinical pathways serve for quality assurance and make a contribution to ensuring net income from case tariff fees. By means of the indication- and procedure-related progression planning, they serve doctors, nurses and therapists as an instrument for the familiarisation and evaluation of the treatment process.

For the business management of a hospital, the clinical pathway presents a strategic management instrument that also serves as an instrument for continual cost controlling, and can contribute to transparency in the provision of services. Knowledge relevant to quality and to supply planning can be acquired and the range of services can be standardised without neglecting the individual requirements of the patients.

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**Patient with chronic pain condition**

- Manifest or threatened impairment of quality of life and/or capability
- Failure of previous unimodal pain therapy, a pain-related surgical intervention, or withdrawal treatment
- Existing medication addiction or medication abuse
- Psychological disease
- Accompanying the pain
- Serious somatic
- Accompanying disease

**Fulfilment of at least 3 criteria to receive a multimodal pain therapy**

Source: own representation after OPS 8-918 (2010)

Figure 1. Pathway entry criteria for multimodal pain therapy (OPS 8-918)
Figure 2. Clinical Pathway: overview pain therapy

Figure 3. Risks in the hospital at the organizational level
| Condition                                      | Code |
|-----------------------------------------------|------|
| Food intake                                   |      |
| - Cachexia (BMI below 15 or 17)               | R64  |
| - Obesity (BMI 30 to less than 35)            | E60.00|
| - Obesity (BMI 35 to 40)                      | E60.01|
| - Dysphagia with supervision, food intake     |      |
| - Dysphagia in absaugpflichtigem tracheostomy | R13.0|
| Other swallowing                             |      |
| Oral thrush                                   | E67.0 |
| Excessive thirst                              | R63.2 |
| Improper diet and nutrition problems          | R63.3 |
| Flatulence and related conditions (belching, bloating, flatulence) | R14  |
| Abnormal weight loss                          | R63.4 |

### Disorders / Age and Behavioral

| Condition                                      | Code |
|-----------------------------------------------|------|
| Senility / old age (do not code with dementia) | R54  |
| Confusion, disorientation (not dementia)       | R41.0 |
| Dementia (not with senility)                   | R03  |
| Fasciculata hemiplegia                        | GB1.0 |
| Spastic hemiplegia                            | GB1.1 |
| Paralysis of one leg                          | GB3.1 |
| Paralysis of an arm                           | GB3.2 |
| Dizziness and giddiness                       | R42  |
| Restlessness and agitation                     | R45.1 |
| Aphasia and dysphasia                         | R47.0 |
| Anaphylaxis and dysarthria                    | R47.1 |
| Blindness in one eye                          | H64.4 |
| Bilateral visual impairment                   | H64.2 |
| Very strong visual impairment                 | H64.7 |
| Blindness in both eyes                        | H64.0 |
| Blinheit one eye, impaired vision in other eye| H64.1 |
| Amblyopia in one eye                          | H64.5 |
| Numbness                                      | H91.9 |
| Tendency to fall (the elderly or the obscure disease states) | R25.6 |
| Difficulty in walking                         | R25.2 |
| Irritability and anger                        | R45.4 |

### Sorschäden

| Condition                                      | Code |
|-----------------------------------------------|------|
| Decubitus first Degree (circumscribed erythema with intact skin) | L89.1- |
| Decubitus second Degree (skin defected)        | L89.2- |
| Decubitus third Degree (deep skin defected)    | L89.3- |
| Decubitus fourth Degree (deep skin defected with bone involvement) | L89.4- |
| Therapy with warfarin (currently)              | Z84.1 |

Figure 4. Performance record sheet of care: care-related comorbidities
• Completeness of the history of pain
• Coordination of medical and nursing history
• Completeness of information on pain diagnostic risks
• Specialist medical verification of the results of the initial diagnostic
• Completeness of information on treatment-related risks
• Definition of all risks associated with treatment-specific applications of drugs can occur
• Completeness of medical and nursing documentation
• Implementation and documentation of the results of interdisciplinary therapeutic assessments
• Completeness of the clinical pathway variance analysis
• Ensure the completeness of technical information for training introduction of an outpatient unimodal pain management
• Compliance with the requirements for internal and external quality assurance

Figure 5. Checklist for Pain Clinical Risk Management

Figure 6a. Total cost for patients with vs. without CP in € (A€)

| Group      | Mean    | Standard deviation | Standard error of the mean | Median   | N  |
|------------|---------|--------------------|----------------------------|----------|----|
| without CP | 3774.42 | 460.483            | 76.747                     | 3642.50  | 36 |
| with CP    | 3085.55 | 212.361            | 39.434                     | 3114.00  | 29 |
| total      | 3467.08 | 504.759            | 62.608                     | 3420.00  | 65 |

Figure 6b. Total cost for patients with vs. without CP in €