Extract from:

Nursing Interventions Requiring an HTA

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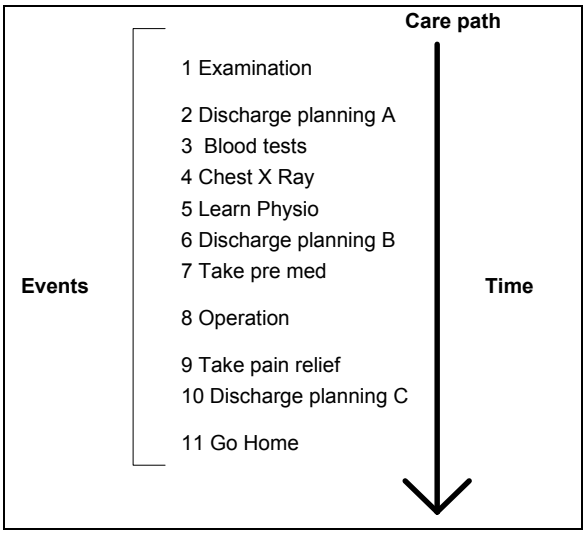
8 Care Pathways

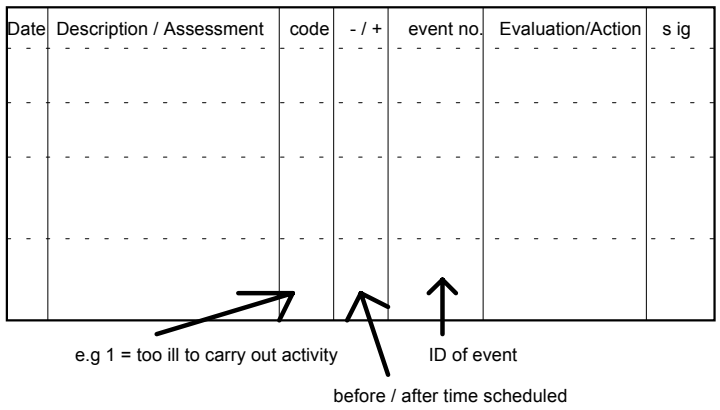
8.1 Introduction

Care Pathways are patient management technologies based upon critical path analysis concepts (Oberstone 1990). They provide a method of process control/optimisation and process/outcome evaluation. Within the health care arena this entails the identification of defined pathways of care, usually procedurally based e.g. hip replacement, and the monitoring of compliance/deviance from the critical path. A simplified hypothetical example is given below:



Individuality is catered for by the use of 'variance' recording:

Variance Record



Clearly the standardised format of data collection facilities audit not only of outcome but also process and resource usage.

The variance form demonstrates the fact that there is an implied assessment and evaluation component associated with each event. In contrast to formal critical path analysis theory dependencies and timing details are not usually included in the model. Similarly optimisation of timing and sequencing of events is done on an informal basis.

Pathways are intended to be developed and implemented in a multidisciplinary manner thus facilitating the development of an integrated delivery and record of care.

The above example is a greatly simplified stylised version of the documentation for a typical care pathway methodology, there being many varieties (Lumsdon & Hagland 1993). It does however represent the core characteristics.

The term 'care pathway' will be used in this report for any patient management technique that possesses the above characteristics.

A large number of individuals were contacted during the investigation of this topic area. Of those interviewed Sue Johnson and Lyn Simpson possess a wealth of knowledge regarding operational details, the former being the Secretary of the Pathways User Group. Additionally Claire Hale possesses an in-depth knowledge of the research literature. A complete list of all those contacted is provided at Appendix A.

8.2 Present Activity

8.2.1 Operational

The introduction of Care Pathways into the acute care sector is usually attributed to the New England Medical Centre in Boston USA where they were first used in 1986 (Petryshen & Petryshen 1992). Since this time uptake has been rapid. Lumsdom & Hagland 1993 reported that over 50% of 581 hospitals in the USA had a 'formal initiative for monitoring and managing clinical processes'. Additionally further testimony is provided by the success of the 'Centre for Case Management', one of many such organisations in the USA that provide consultancy and prepared Care Pathways.

Within the UK, Care Pathways have been implemented in at least 25 hospitals (Murray 1994, Wilson 1994, Johnson 1994). Two early projects were those based at North West Thames Regional Health Authority (Murray 1994) where work commenced in 1990 involving 12 pilot sites in the region, and Northallerton Hospital where work began in 1992 (Brown & Simpson 1994). Financing for most projects is usually via the Resource Management Initiative, and clinical audit funds although hospitals now appear to be developing Care Pathways without additional funding.

Within the UK hospitals developing Care Pathways the level of coverage varies depending upon the degree of experience. The table below provides a list of those Care Pathways which have been developed or are presently being developed at the Friarage Hospital Northallerton, a hospital with a high level of experience:

Department	Care Pathway
Day Unit	Inguinal Hernia
	Arthroscopy
	Colonoscopy
	Breast Biopsy
	Gastroscopy
	Hand & Foot Surgery
	Removal of Foreign Body/Metal Ware
	Minor Surgical Ops.
	Circumcision
	Dental Treatment
	Varicose Veins
	Sigmoidoscopy
	Bilateral Vasectomy
	Anal Fistula
	Cystoscopy
Gynaecology	Abdo Hysterectomy
	Pelvic Floor Repair
	Cone Biopsy
	Cystoscopy
	Coloposcopy
	Urodymanic Study
	Bladder Drill
	Hysteroscopy
	Bleeding in Early Pregnancy leading to ERPC
	Laparoscopy
	Termination of Pregnancy
	Infertility
	Water Birth
Child Health	Child with asthma
	Grommets
	Hypoglycaemia (for neonatal unit)
Surgical	Trans Urethral Resection of Prostate

	Hernia (non day case)
	Lap Cholecystectomy
Orthopaedics	Total Hip Replacement
	Total Knee Replacement
	Fracture Neck of Femur
Medical	Myocardial Infarction
	Newly diagnosed diabetic (Insulin and Non-insulin)
Mental Health	In-patient assessment
	De-toxification Regime
	Vine House Day Hospital Assessment
Community Services	Leg Ulcer
	Diabetic
	Haematology
	Breast Services
	Assessment of the Elderly
	Management of children with Special Needs

In contrast a relatively new site such as Shotley Bridge Hospital, County Durham has one care pathway implemented so far, that for Total hip replacement. Other sites are in the process of developing their first one.

Several pathways involving community and acute services, including the 'Hospital at Home' scheme are under development:

Client group	Details	Site/contact
Child with Asthma	Community and Home	Northern & Yorkshire Regional Health Authority Project. Elaine Morris Albian Health Centre North Shields
Hip Replacement	Hospital at Home Scheme. Home visit pre assessment. 8 days in hospital 4 at home	Sue Lloyd Thomas West Middlesex Hospital London
Hysterectomy	Hospital at Home Scheme. Home visit pre assessment. 3 days in hospital 7 at home	Sue Lloyd Thomas West Middlesex Hospital London
Hip Replacement	Hospital at Home Scheme. Home visit pre assessment. ? days in hospital ? at home	Sue Johnson Ashford Hospital Middlesex London

Hysterectomy	Hospital at Home Scheme. Home visit pre assessment. ? days in hospital ? at home	Sue Johnson Ashford Hospital Middlesex London

Ashford Hospital is planning to incorporate medical protocols into the design of the MI pathway, similar to the pathway developed at Addenbrooke's for MI.

The traditional American criteria used for selecting a client group for care pathing includes:

- High Volume
- High Cost
- High Variability
- High Risk

The rationale for such criteria, targeting those areas with the greatest possible saving potential, ignores important contextual issues relating to the NHS.

Brown & Simpson (1994) emphasis the importance of change management including local ownership of the pathways developed. Interestingly the problems recently reported concerning the implementation of Clinical Guidelines for doctors (Delamothe 1993) may have been avoided if this approach had been adopted.

Excellent change management skills and top level commitment appear to be one of the keys to success, particularly if the traditional criteria for selecting a client group is used. However, the NHS is awash with failures due to top level, big bang approaches such as HISS (Hospital Information Support Systems) and to a lesser extent the RMI.

The unique organisational structure of the NHS consisting of 'autonomous professionals' (Checkland 1990) suggests a bottom up approach is likely to be more successful.

Taking this viewpoint one or two sites have started with simple outpatients procedures in contrast to complex pathways passing through several different departments. Clearly this is the preferred approach if one does not wish to take on the organisational culture at the same time as implementing a care pathway. Discussions in fact suggest that the care pathway itself may act as a catalyst of change. In such instances the motivation for implementing the pathway appears the desire to improve care delivery rather than advance

efficiency per se. One site has chosen to implement Care Pathways as a form of improving communication between care givers and clients.

The costs of implementing Care Pathways is difficult to assess, most hospitals developing them employ one to two full time 'care pathway developers'. This does not take into account the time dedicated to multidisciplinary and unidisciplinary team meetings. However the cost is probably out weighed by the very valuable cathartic nature of the experience which is frequently reported. Occasionally a hospital is using an independent consultant. This presumably will be a short lived expense as staff become competent in the development process themselves.

8.2.2 Projected Level of Activity

Consideration of three factors suggest that the use of Care Pathways will, at least in the immediate future, rise substantially.

Firstly visiting some of the sites using Care Pathways demonstrated a high degree of enthusiasm from all those involved from project manager to ward nurses and clients. The perceived benefits included:

Perspective	Benefit
Project manager	Structure, Audit Development of a true Multidisciplinary team Preferred method of providing information to GPFHs/DHAs concerning procedures
Ward Staff	Reduction in paper work Removal of care plans
Patients	Increased knowledge of plan of care, ability to take a more active role

Secondly the political agenda is publicly supporting the implementation of Care Pathways as a quality measure (NHSME 1993).

Thirdly an American organisation specialising in Care Pathways and risk assessment/control has started to aggressively target the NHS as a possible buyer.

8.2.3 Research

The present level of independent research activity into Care Pathways within the UK appears virtually non

existent. Funds have been applied for in order to investigate the use of Care Pathways in fractured hip jointly by the CHSR and the Nursing Development Unit, Royal Victoria Infirmary in Newcastle upon Tyne. However here Care Pathways are being introduced within the context of nursing case management, which represents a specific organisational system aimed at improving cross-departmental functioning.

Audit activity, which usually implies 'variance analysis' in this context does not at this time provide the rigor required for a formal assessment of this management technology.

8.3 Published Literature

Information presented in this section is partly based upon that kindly provided by Claire Hale.

Much of the so called research in this area is very poor. For example Hofmann (1993) (n = 20; 24) fails to provide the necessary inferential statistic regarding group differences, after presenting percentage scores which she interprets as being meaningful.

A large number of studies are based on single group pre post test design (Campbell 1966 provides details regarding the dangers of such a design). Weilitz & Potter (1993) (n = 1452; 1644) using this design over a two year period again fail to provide the necessary inferential statistics. The report also mentions the ability to make comparisons with national figures acting as a quasi-control group but fails to present any such data.

Ogilvie-Harris, Botsford and Worden Hawker (1993) carried out a before/after prospective cohort study with the first group acting as the control group (n= 51; 55). A six month lag period was included in the design.

In contrast to the above reports, Woodward et al (1994) offers a significant improvement with regard to statistical analysis, using multiple regression equations and letting 'use of care path' act as a dummy variable. He has demonstrated that *from various runs* for five DRG bands over a four year period (1989 to 1991 pre care pathway; 1991 to 1993 post care pathway) a significant reduction in cost per discharge but not length of stay has been achieved for two groups (Chemotherapy and Caesarean Section).

Unfortunately, in contrast to the statistical rigor of this unpublished report (see reference) Woodward fails to provide any form of comparison to allow for the assessment of any extraneous variables over the time period (History effects See Cook & Campbell 1979).

The table below provides details of 'major' findings from the above studies which clearly must be interpreted with care considering the comments made above.

Study	Less complications	Reduced Length of stay	Reduced Cost	Reduced time in ITU
Ogilvie-Harris, Botsford et al 1993	p = 0.01	p = 0.047 (<29 day Los sub group)		
Weilitz & Potter 1993		'yes'	'yes'	'yes'
Hofmann 1993	'yes'			
Woodward et al 1994			Significant but DRG dependent - see text	

Considering Care Pathways as a component of case management in acute settings Petryshen & Petryshen (1992) present a review of the case management model, which for this discussion can be considered to be an equivalent management technology. They state:

> 'The case management model can have a positive impact on nurses. The case management approach requires nurses to assume an active role in designing care maps and to work collaboratively with members of a case management team. In addition, management skills such as controlling, directing, delegating and co-ordinating are used at the case level. These responsibilities can enhance the nurse's sense of autonomy and professional recognition. .....
>
> This care delivery system focuses on optimal patient outcomes, fiscally responsible lengths of stay, appropriate resource allocation and increased cost awareness....
>
> This process of managing patient care fosters collaborative relationships between patients, care givers."

The above extract highlights once again the potential benefits of Care Pathways from an organisational perspective.

No work seems to have been carried out regarding the use of Care Pathways on patient satisfaction. Anecdotal evidence (Murray 1994) suggests that the client group may be important, the elderly disliking patient focused care.

Overall both the quantity and quality of published research appears to be poor. To date no serious research has been published in this country (Johnson 1994, Brown & Simpson 1994, Murray 1994).

8.4 Discussion/Recommendations

Care Pathways appear to be becoming rapidly accepted in acute care, and nurses are integral to this development. However at the present time the benefits, whatever they might be, particularly from the patients perspective, appear to be less than conclusive.

Evaluation of Care Pathways provides an exciting, and necessary, challenge for several reasons:

1. Complex nature of the treatment variable 'care pathway' and its constituent parts.
2. Complex relationship of the treatment variable to other social/organisational variables such as communication between staff and patients.
3. Complex nature of the learning required to adopt Care Pathways.
4. Relationship between process and outcome unclear BUT provides opportunity to collect and analyse unique process data due to nature of Care Pathways.
5. Benefits difficult to measure BUT rare opportunity to carry out bottom up costings and trend analysis of patient satisfaction.
6. Superficially appear to provide the tool to solve a whole range of unrelated problems from documentation, discharge planning through to patient satisfaction.

The above factors suggest a variety of research areas that need investigation.

Research should be aimed to

1. Evaluate client centred outcomes for distinct groups.
2. Development a client centred development/use methodology.
3. Identify the most effective way of implementing Care Pathways.

4. Identify the 'core components' that make Care Pathways so attractive to various groups.
5. Consider the development of a national standardised coding system for variances and events possibly forming links with the CAMS centre.
6. Consider the development of computer systems to support various aspects of the process.
7. Consider the cost effectiveness of the development of an entity within the NHS to support the co-ordination and dissemination of information etc.
8. Investigate the use of care plans to facilitate research in the other topic areas identified in this report.
9. Investigate the possibility of linking some aspects of the work involving clinical guidelines to that of Care Pathways.
10. Consider the adoption of some of the characteristics of classical path analysis theory such as 'throughput optimisation' to Care Pathways.

In conclusion it would appear appropriate strategically to conduct HTA in small clearly defined areas of the Care Pathways environment (e.g. patient, care giver, organisation) and their effectiveness as tools rather than the blanket evaluation of Care Pathways per se.

Contacts:

Name	Contact	Comments
Sue Johnson	Tel. 0784 884637 ICP Facilitator Ashford hospital London Rd. Ashford Middlesex TW15 3AA	Provides training to other hospitals
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Alison Thorne	tel. 091 2596660 Project Nurse North Tyneside General hospital North Shields	Interest in developing care pathways for psychiatry
Graham Morgan	Central Middlesex	Unable to contact
	St Mary's Paddington	Unable to contact