Developing and implementing diabetes care pathways

Sarah V O'Brien, Kevin J Hardy

Introduction

Implementation of the National Service Framework for Diabetes will pose a significant challenge to professionals in both primary and secondary care. We report our experience of developing and implementing a whole-system, pathway of care driven approach to diabetes management across a health community over the past 4 years. Our aim is to share our experiences in pathway development and provide clinicians with templates that they can adapt to their own clinical environment to facilitate implementation of the diabetes NSF.

People with diabetes rightly expect care that is timely, accessible and of uniformly high quality. But diabetes care is complex, multifaceted and delivered in a wide range of clinical settings by healthcare professionals from diverse backgrounds and with diverse skills.

Care pathways improve the delivery of effective care, facilitate critical evaluation of that care and strengthen multidisciplinary communication (Kitchiner et al, 1996; Schaldach, 1997; Chang et al, 1999). They promote a uniform standard of care delivery in a wide variety of clinical settings.

The Welsh National Assembly (1999), The NHS Plan (Secretary of State for Health, 2000), the Commission for Health Improvement, the National Institute for Clinical Excellence and recent National Service Frameworks (including the diabetes NSF) all emphasise the importance of care pathways in realising national goals for better health care.

What are care pathways?

There are many definitions of care pathways and no nationally agreed format, but certain key features separate care pathways from clinical guidelines. A pathway maps the expected route of care for a patient within a specified setting. Timeframes are often explicit, with interventions specified in chronological order, and pathways are typically multidisciplinary.

A core feature of pathways is variance analysis (Gottlieb et al, 1996; Kitchiner et al, 1996; Campbell et al, 1998). Variance analysis is a record of deviations from the care pathway, with an explanation of the deviation. Analysis of these variances is undertaken to inform (and improve) care. Variances from a pathway may be coded in a variety of ways to facilitate analysis. Variance from a pathway should not be viewed as a failure, as it allows clinicians to individualise care, to record shortfalls in the system that are preventing optimum care, and to record situations where the clinician's experience and clinical judgment dictate a different pattern of care from the norm. Variance analysis permits continuous audit and quality improvement.

The first pathways to be developed and used in health care were largely for surgical procedures, such as cataract extraction, and much of the literature on care pathways relates to surgical conditions and interventions. Complex medical problems, such as diabetes, are more difficult to map, and pathway development in medicine is less developed as a result. Our experience, however, suggests that care pathways are also useful for such conditions.

Development of the care pathways

In 1997, we invited a Regional Accreditation Visit of District Diabetes Services, which included a survey of patients' views. We were able to identify several areas of concern:

ARTICLE POINTS

1 Care pathways are widely regarded as an important tool for delivering the NSF for Diabetes.

2 Care pathways improve care and strengthen multidisciplinary communication.

3 Care pathways were developed for diabetes management across the whole health community.

4 The care pathways described here were tested and have significantly transformed local diabetes services.

5 The successful development of care pathways requires a strong team leader and dedicated time.

6 Our pathways could be used and adapted to fit other diabetes services.

KEY WORDS

- **Care pathways**
- **Variance analysis**
- **Diabetes management**

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1 Changes were needed to improve consistency of patient care.

2 The care pathway was a chronological summary of each intervention experienced by the patient during a clinical episode and formed part of the patient record.

3 A key factor in the success of the pathways was that they were developed in stages.

4 Patient feedback after implementation of the pathways was very positive.

- There was no system in place to ensure that patients received consistent medical management and advice (patients who responded to surveys highlighted inconsistent advice as a particular source of frustration).
- There was no formal programme of patient education, and education was delivered in busy clinics with constant interruptions, or as one-off sessions to unacceptably large groups.
- There were few means of measuring the effectiveness of education and other interventions.
- No measures of patient satisfaction were being undertaken.
- Documentation was ad hoc, incomplete and non-centralised. Nurse specialists often recorded interventions separately from doctors, dietitians and podiatrists, and advice given to patients was not clearly documented.

It was evident that changes were needed to improve consistency of patient care, to standardise and improve documentation of patient education, to promote more efficient use of resources, to develop and improve tools for measuring effectiveness of clinical care and patient satisfaction, and to facilitate better audit and evaluation. A review of the literature failed to reveal an appropriate pathway so we devised our own.

All the pathways we have developed comprise two key elements: a set of evidence-based standards underpinning the pathway, and the pathway itself. The standards did not form part of the patient record but were kept in clinical areas for reference. They were also available for audit or external review to explain the patient care process fully. The pathway was a chronological summary of each intervention experienced by the patient during a clinical episode, and formed part of the patient record.

What worked for us

Our pathways mapped screening and diagnosis, initial management in primary care, referral to secondary care, all care in hospital specialist clinics, inpatient care and ongoing management in primary care.

A key factor in the success of the pathways was that they were developed in stages. We started with hospital outpatient clinics, and only moved on to inpatient pathways and the current pilot studies of pathways in primary care once these had been refined and accepted.

We incorporated tools and initiatives into the pathways to address previous shortfalls in our service, such as: a reminder phone call and pack sent to patients before the first appointment to reduce non-attendance; knowledge, wellbeing and patient satisfaction questionnaires to measure the impact of our education programmes; a staff education pack to ensure consistency of information and advice; and a patient information book to ensure consistency of written information throughout the health community.

The outpatient pathways were first implemented in March 1999; initially we did not measure variance analysis, in order to allow clinicians time to adjust to the new system and paperwork. Subsequently, variance analysis proved to be an invaluable tool for identifying and subsequently addressing weaknesses in the pathway format and the clinical process. The pathways transformed our care programme into a highly structured, evidence-based, patient-centred service.

As reported elsewhere (Hardy et al, 2001), formal evaluation of the new patient clinic pathway demonstrated a highly significant reduction in non-attendance, improvements in patient knowledge and wellbeing and better HbA_{1c} results (O'Brien and Hardy, 2000). Introduction of care pathways was also associated with a change in culture within our unit. The service was no longer didactic and systems-oriented, but more flexible and responsive to patients' views. Every patient was given a 'feedback form' and encouraged to record their views (good or bad) on the service. Feedback has been extremely positive.

Following the success of the initial pathways, we developed pathways for all our outpatient clinics, including those for: nephropathy; combination therapy (for patients starting insulin and tablets); insulin (for patients starting insulin monotherapy); community support (nurse-led clinics); foot ulcer; and joint antenatal and young persons. Improvements in the nephropathy clinic

since the introduction of the pathway have included lower mean blood pressure, more patients on angiotensin-converting enzyme inhibitors, improvements in mean HbA_{1c}, and very favourable rates of death, dialysis and doubling of serum creatinine (O'Brien and Hardy, 2001; O'Brien et al, 2002).

Following the success of our outpatient pathways, we developed inpatient care pathways in consultation with ward staff. These care pathways include blood glucose monitoring, management of glucose potassium insulin (GKI) infusion regimens, investigations to be ordered for inpatients with diabetes, and interpretation and action on diabetes-related inpatient investigations. We have recently completed a randomised controlled trial of these pathways in the medical wards of our district general hospital.

The final stage was to develop care pathways for primary care. After 2 years of use and refinement of the outpatient pathways, the format was working success -fully and was accepted by representatives from primary care as a template for care pathways. A pathway subgroup of the local Diabetes Health Improvement Programme group was established and pathways were developed for screening, diagnosis, initial management, ongoing management, education and referral to secondary care. These primary care pathways are currently being piloted.

Every effort has been made to make our pathways clear, simple to use, not excessively time-consuming and a comprehensive record of each interaction between the patient and multidisciplinary team member. Our outpatient pathways have been well tested and their success proven. However, success of the inpatient pathways and primary care pathways has not yet been demonstrated, but experience suggests that they too will enhance the care we deliver to our patients with diabetes.

Where we struggled

Development of the pathways was time consuming. Regular multidisciplinary team meetings were essential to gain acceptance by members of the diabetes team. Critical evaluation of current practice and identification of key areas for change were crucial to the development and implementation of the pathways. This process was sometimes a difficult and potentially threatening experience.

The inpatient and primary care pathways presented other difficulties. It was essential to involve key stakeholders, and the largest hurdle was convincing a wide range of professionals to change the way they approached diabetes care. Regular meetings and dedicated time to develop the pathways were crucial.

Ongoing, regular analysis of variances from pathways is an essential component of services driven by care pathways, but is time consuming. We overcame this problem to some extent by reviewing pathway variances from a selection of clinics on a monthly basis and giving feedback on the results at our weekly team meetings. Our experience suggests that we will only be able to fully evaluate variances from the care pathways when we have an electronic patient information system.

Lessons learned

A strong team leader and dedicated time are the key to successful development and implementation of care pathways.

It is essential that care pathways are simple to use and that other paperwork is kept to a minimum. We have constantly evaluated the format of our care pathways and they have evolved from masses of paperwork into increasingly concise documents. We ensured that detailed standards underpinned the pathways, but kept these separate from the paperwork to enable us to specify the pathways of care in great detail while keeping paperwork to a minimum. Pathways provide a robust method for defending potential complaints.

Conclusions

Care pathways are widely believed to be an important tool for ensuring the delivery of high quality, evidence-based care and are a key feature of the diabetes NSF. We have developed, implemented and evaluated diabetes care pathways extensively over the last 4 years and strongly advocate their use as a tool to improve the quality of diabetes services. The pathways presented in this paper could be used and adapted

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Date: _____
Time arrived: _____
Clinic nurse notes to Dr: _____
Appt. time: _____
Clinic nurse: _____
Time seen: _____

Diabetes Care Pathways

Hospital outpatients: Clinics: New patient; Education; Insulin; Discharge assessment; Community support; Joint antenatal and young persons; Nephropathy; Foot ulcer
Hospital inpatients: Blood glucose monitoring, investigations, GKI
Primary care: Screening & diagnosis, initial management, ongoing management, education, referrals

	Y	N		
New Patients Only				
Is diagnosis confirmed?	__	__	If yes, give info. sheet __ If no, explain possibility	__
Has Pt completed Educ. Clinic	__	__	If no, arrange Friday am clinic	__
Get KQ & WBQ & record score	__	__		
All Patients				
Pt satisfaction questionnaire	__	__		
Urinalysis	__	__	If nitrite or blood, do MSSU	__
Explain medications	__	__		
Is HbA_{1c} < target?	__	__	If no, adjust meds / review exercise & diet	__
Is Pt on max. irbesartan / ramipril?	__	__	If no, start & ask GP to titrate	__
Is BP < target?	__	__	If no, adjust prescription as protocol	__
Does Pt need dietitian?	__	__	1st visit __ , Creat.>150 __ , K^+>5.2 __ , Phos. __ , gly	__
Has Pt gained weight?	__	__	If yes, discuss __ or refer dietitian	__
Does Pt need fasting lipids?	__	__	Annual check or if Rx changed last visit	
Does statin need starting or ?	__	__	If yes, ask GP to start / atorvastatin or simvastatin	__
Does fibrate need starting?	__	__	If yes, ask GP to start gemfibrozil	__
Arrange ACR	__	__		
Arrange U&Es	__	__		
Was last creatinine >120 μmol/litre?	__	__	If yes, do FBC, ferritin (see standard 13 for Mx)	__
Was last creatinine >150 μmol/litre?	__	__	If yes, do Ca^{2+}, PO_4^{3-}, HCO_3., PTH (see standard 14)	__
Does Pt need referral to nephrologist?	__	__	EPO __ ,PO_4^{3-} __ general deterioration	__
Is Pt on aspirin?	__	__	If no & no contraindications, start 75mg od	__
Is annual check due?	__	__	If yes, medical history, remind eyes & feet & to re-read education book	__
Discuss CVS risk reduction	__	__		
Does Pt have education book?	__	__	If yes, check read & understood it __ if no, give one	__
Have new drugs been started?	__	__	If yes, give drug information sheet	__
Arrange appointments	__	__		
Give Pt copy sheet	__	__	Ask Pt if want copy GP letter (to be posted)	__
Send GP sheet & letter	__	__		
Record time finish	_____		Doctor/DSN:	_____

Figure 1. Diabetes nephropathy clinic care pathway (adapted from the original). ACR = albumin:creatinine ratio; BP = blood pressure; CVS = cardiovascular system; EPO = erythropoietin injections; FBC = full blood count; GKI = glucose potassium insulin; Gly = glycaemia; KQ = knowledge questionnaire; MSSU = midstream specimen of urine; Mx = management; PTH = parathyroid hormone; U&Es = urea and electrolytes; WBQ = wellbeing questionnaire.

to fit other diabetes services. If there is commitment and sufficient support within the healthcare team, care pathways can be a tool for achieving effective, evidence-based diabetes care. ■

Figure 1 shows a sample pathway. Copies of the actual pathway can be obtained by emailing the author at: sarahobuk@yahoo.co.uk

Campbell H, Hotchkiss R, Bradshaw N et al (1998) Integrated care pathways. *British Medical Journal* **316**: 133–7

Chang PL, Wang TM, Huang ST et al (1999) Effects of implementation of 18 clinical pathways on costs and quality of care among patients undergoing urological surgery. *The Journal of Urology* **161**: 1858–62

Department of Health (2003) *National Service Framework for Diabetes.* DoH, London

Gottlieb LD, Roer D, Jega K et al (1996) Clinical pathway for pneumonia: development, implementation, and initial experience. Best Practice and Benchmarking in Healthcare **1**: 262–5

Hardy KJ, O'Brien SV, Furlong NJ (2001) Information given to patients before appointments and its effect on non-attendance rate. *British Medical Journal* **323**: 1298–300

Kitchiner D, Davidson C, Bundred P (1996) Integrated care pathways: effective tools for continuous evaluation of clinical practice. *Journal of Evaluation in Clinical Practice* **2**: 65–9

National Assembly for Wales (1999) *An Introduction to Clinical Pathways.* National Assembly for Wales, Cardiff

O'Brien SV, Hardy KJ (2000) Impact of a care pathway-driven diabetes education programme. *Journal of Diabetes Nursing* **4**: 147–9

O'Brien SV, Hardy KJ (2001) Nurse-led nephropathy clinic associated with improved management. *Diabetic Medicine* (Suppl 2): A94

O'Brien SV, Hulme SA, Furlong NJ, Hardy KJ (2002) Effects on death, dialysis and doubling of serum creatinine of renin-angiotensin-aldosterone-system blockade and blood pressure control in diabetic nephropathy achievable in routine clinical care. *Diabetes* **51**(Suppl 2): A188

Schaldach DE (1997) Measuring quality and cost of care: evaluation of an amputation clinical pathway. *Journal of Vascular Nursing* **15**(1): 13–20

Secretary of State for Health (2000) *The NHS Plan: A Plan for Investment, A Plan for Reform.* Stationery Office, London