

DIABETES

EVIDENCE SUMMARY

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Diabetes.....	1
Model assumptions.....	1
Supporting evidence.....	3
Useful resources.....	10

Appendix 1 Building blocks of diabetes care, 2006

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Diabetes

Model assumptions

Healthcare Resource Groups

The report refers to hospital activity coded to the following healthcare resource groups (HRGs):

HRG Code	Description
K11	Diabetes with Hypoglycaemic Emergency >69 or w cc
K12	Diabetes with Hypoglycaemic Emergency <70 w/o cc
K13	Diabetes with Hyperglycaemic Emergency >69 or w cc
K14	Diabetes with Hyperglycaemic Emergency <70 w/o cc
K15	Diabetes and Other Hyperglycaemic Disorder >69 or w cc
K16	Diabetes and Other Hyperglycaemic Disorder <70 w/o cc
K17	Diabetes with Lower Limb Complications

Please note that the following refers to the HRGs listed in the table above, and does not include diabetes in childhood (HRG P29).

Assumptions applied

Diabetic conditions, such as ketoacidosis and hypoglycaemia, are recognised as 'ambulatory care sensitive' (ACS) conditions and hence a significant proportion of hospitalisations are preventable through appropriate management in the community / primary care¹.

The Base Case assumptions used are as follows:

¹ NHS Institute for Innovation and Improvement. (2006). Directory of ambulatory emergency care for adults. NHS Institute, University of Warwick, Coventry.

- Between 60% and 75% of admissions for diabetes with hypoglycaemic emergencies and diabetes with other disorders are avoidable;
- About 25% of admissions for diabetes with hyperglycaemic emergencies are avoidable;
- About 35% of admissions for diabetes with lower limb complications can be avoided;
- Patients admitted for diabetes with hypoglycaemic emergencies (without complications) can be discharged within 1-2 days on average;
- Patients admitted for diabetes with hyperglycaemic emergencies can be discharged within 2-5 days on average; and
- Patients admitted with diabetes with lower limb complications can be discharged within 10 days on average².

These assumptions are **applied** to an admitted care dataset to provide an indication of the potential change in acute hospital caseload if evidence-informed 'best practice' obtains. The validity of the assumptions should be checked against local circumstances using the evidence presented below.

It should also be noted that these Base Case assumptions are **not** applied to patients in an admitted care dataset who are in some way 'atypical'. Atypical patients are defined as: those who are transferred in or transferred out of a hospital; die in hospital; or were 'outliers' based on length of stay³.

The 'admission avoidance' proportions provide an estimate of the current number of patients who could be managed in a setting other than an acute/specialist hospital, such as local community hospital, polyclinic or with appropriate hospital-at-home /community support.

The 'length of stay' assumptions provide an indication of the potential for earlier supported discharge. The length of stay figures above are similar to those already achieved by the top 25% of Trusts within England at present⁴.

² Note that this does not include amputations, which are coded to vascular HRGs Q15 and Q16.

³ Where the length of stay is greater than the 'trim point for each HRG'. Trim points are set under PbR and defined (statistically) as a length of stay significantly longer than the population average

⁴ Based on National Reference Cost submissions for 2005/06.

Supporting evidence

Introduction

As a chronic disease, under-recognition and under-treatment of diabetes is an important factor leading to acute crises and diabetic complications. Management of patients with diabetes involves putting them on the right therapeutic regime for treatment and regular monitoring of the condition in general practice, usually by specialist nurses and other allied health professionals (e.g. podiatry, optometry) in consultation with the GP.

Good care for diabetic patients involves a wide and complex set of different services and health professionals, working in partnership with each other and with patients⁵ (Appendix 1).

Findings

There is good evidence about what clinical interventions improve diabetes care. The benefits of systematic approaches to care, recall systems and routine surveillance are well established^{6 7}.

Improved care leads to better glycaemic control, which, together with control of weight, cholesterol and BP, results in fewer complications and better long-term outcomes.

⁵ NHS Scotland (2006) Diabetes Action Plan.

⁶ Griffin S., Kinmonth AL. (1998). Systems for routine surveillance for people with diabetes mellitus. The Cochrane Database of Systematic Reviews.

⁷ Renders CM, Valk GD, Griffin S, et al. (2000). Interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings. The Cochrane Database of Systematic Reviews.

The Diabetes National Service Framework (NSF)⁸ noted that people with diabetes are admitted to hospital twice as often, and stay twice as long, as those without diabetes. Patients with diabetes occupy about one in ten acute hospital beds and the condition is responsible for prolonged inpatient stays⁹.

The NSF states that timely liaison with the diabetes team can both prevent the need for diabetes-related admissions and, where hospital admission is unavoidable, prevent complications during admission and delayed discharge.

The NSF emphasised the importance of good inpatient diabetes care in the UK, including the value of inpatient management guidelines. It explicitly recommended the adoption of a service model based on the 'diabetes inpatient specialist nurse' (DISN). There is now evidence to indicate that the DISN model can significantly reduce excess diabetes bed occupancy¹⁰.

Acute complications of diabetes include diabetic ketoacidosis (DKA) and hyperosmolar non-ketotic syndrome (HONK), both of which are characterised by very high blood glucose levels, resulting from a severe lack of insulin, and hypoglycaemia, when the blood glucose level falls too low.

People who develop DKA require urgent hospital treatment - however, DKA is an avoidable. The prevalence of the acute complications of diabetes, such as DKA and HONK, can be reduced through education of people with diabetes and all 'front line' health professionals.

⁸ Available at the DH website at:
<http://www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/Diabetes/fs/en> (last accessed 16/07/2007)

⁹ Sampson MJ, Dozio N, Ferguson, Dhatariya K. (2007). Total and excess bed occupancy by age, speciality and insulin use for nearly one million diabetic patients discharged from all English Acute Hospitals. *Diabetes Research and Clinical Practice*; 77: 92-98.

¹⁰ Sampson MJ, Crowle T, Dhatariya K, *et al.* (2006). Trends in bed occupancy for inpatients with diabetes before and after the introduction of a diabetes specialist nurse service. *Diabetic Medicine*; 23: 1008-1018.

The Diabetes NSF identified two key interventions:

- The risk and severity of diabetic ketoacidosis can be reduced by the provision of guidance and advice to people with diabetes on how to manage changes in blood glucose control that occur during other illnesses ('sick day' rules); and
- Most episodes of hypoglycaemia can be managed in the community, either by the person with diabetes, a relative or carer, their GP, or by ambulance personnel.

Research indicates two valuable service components for implementing better diabetes care¹¹:

- Creation and use of a comprehensive diabetic registry; and
- Development of a multi-disciplinary protocol based on best evidence.

Key service objectives should be to ensure¹²:

- Patients are engaged in their own care and enabled to self-care;
- Diabetics teams are organised so that patients are actively sought out to ensure that they receive the best care; and
- Care is planned as a partnership between health professionals and patients.

There is evidence that educational interventions and promoting self-care is beneficial, although this is a complex issue and patients require support to develop their skills to manage their condition effectively^{13 14}.

¹¹ Bandolier. (2005). Implementing better diabetes care. Bandolier 140. Available at: <http://www.jr2.ox.ac.uk/Bandolier/>

¹² Roberts S. (2007). Working together for better diabetes care. Clinical case for change. Department of Health.

¹³ Norris SL, Nichols PJ, Caspersen CJ, *et al.* (2002). Increasing diabetes self management education in community settings: a systematic review. *American Journal of Preventive Medicine*; 22 (4S): 39-66.

¹⁴ Deakin T, McShane CE, Cade JE, Williams RDRR. (2005). Group based training for self-management strategies in people with type 2 diabetes mellitus. *Cochrane Database of Systematic Reviews*; Issue 2. No. CD003417.

The value of self-monitoring of blood glucose, alone or with instruction, however, is more problematic¹⁵.

The National Institute for Health and Clinical Excellence has produced guidance on patient education models for diabetes¹⁶. In addition, a number of specific structured education programmes have been developed to provide patients with the necessary skills. These include:

- Dose Adjustment for Normal Eating (DAFNE) for patients with type 1 diabetes; and
- Diabetes Education and Self Management for Ongoing and Newly Diagnosed (DESMOND) for patients with type 2 diabetes¹⁷.

Education and self-monitoring is usually developed alongside 'care planning', which is described as a process whereby people are actively involved in deciding, agreeing and 'owning' how their diabetes will be managed in partnership with health professionals¹⁸.

The application of disease management programmes has been shown to produce improvements in disease outcomes for diabetics, including reductions in emergency admissions and use of hospital bed days¹⁹.

¹⁵ Farmer A, Wade A, Goyder E, *et al.* (2007). Impact of self monitoring of blood glucose in the management of patients with non-insulin treated diabetes: open parallel group randomised trial. *British Medical Journal*; doi:10.1136/bmj.39247.447431.BE.

¹⁶ NICE. (2003). Guidance on the use of patient-education models for diabetes. *Technology Appraisal 60*.

¹⁷ Department of Health. (2004). Structured education for people with type 2 diabetes. Providing the DESMOND newly diagnosed programme in PCTs in England. DH, London.

¹⁸ Department of Health. (2006). Care Planning in Diabetes: Report from the joint Department of Health and Diabetes UK Care Planning Working Group. DoH, London.

¹⁹ DoH. (2004). Chronic Disease Management: A Compendium of Information. Department of Health, London.

Hospitalisation is not required to initiate or adjust therapy. A recent consensus statement by the American Diabetes Association and the European Association for the Study of Diabetes noted the following for patients with Type 2 diabetes²⁰:

“Except in rare circumstances ... hospitalization is not required to initiate or adjust therapy. The patient is the key player in the diabetes care team and should be trained to prevent and treat hypoglycaemia, as well as to adjust medications with the guidance of health care providers to achieve glycemic goals.”

The evidence is clear that good glycaemia control, through appropriate and timely interventions and therapy, can significantly reduce morbidity / long-term complications related to diabetes.

Implementing good practice for diabetes care that emphasises improved specialist management, particularly in primary care, can significantly reduce the volume of unscheduled admissions and facilitate earlier discharge.

Recent evidence from a survey by the Healthcare Commission notes that, whilst progress is being made on implementation of NSF standards, there is still significant further progress that can be made nationally and locally²¹. The report identified the following areas for improvement in many Primary Care Trusts in England:

- Better partnership between people with diabetes and their healthcare professionals when planning and agreeing care;
- Increasing the number of people with diabetes attending education courses and improving their knowledge of diabetes;
- Work more closely with all organisations providing and commissioning diabetes services;

²⁰ Nathan DM, *et al.* (2006). Management of Hyperglycaemia in Type 2 Diabetes: a consensus algorithm for the initiation and adjustment of therapy. *Diabetes Care*; 29 (8): 1963-1972.

²¹ Healthcare Commission. (2007). Managing diabetes. Service review. Commission for Healthcare Audit and Inspection. London.

- Increasing the number of people with diabetes having long term blood glucose levels (HbA1c) of 7.4 or a lower safe level; and
- Reducing variation in general practice achievements.

To help Primary Care Trusts to improve the delivery of best practice care for diabetics, the Department of Health has released a Commissioning Toolkit²². This toolkit has been designed to support NHS commissioners develop high-quality services local services that adhere to accepted national standards and good generic practice, whilst also reflecting local circumstances. The toolkit provides:

- Advice on health needs assessment;
- A generic specification for diabetes care ;
- Suggestions for indicators; and
- Key outcomes (and metrics) that commissioners should consider when commissioning services²³.

Implementing best practice care for diabetics involves enhancing the provision of community and primary care services, staffed by health professionals with appropriate skills. A recent guidance document on 'high impact changes for practice based teams' identified the following key changes to improve the management of patients with long-term conditions, including diabetes²⁴:

- Validate disease registers;
- Develop proactive call and recall systems;
- Use templates for patient management;
- Identify and provide 'bespoke care' to those with complex needs;

²² Department of Health. (2006). Diabetes commissioning toolkit. DH, London.

²³ Linked to the commissioning toolkit, Yorkshire and Humberside Public Health Observatory has produced a summary of diabetes measures based on The Better Metrics Project to help local services assess "where they are now". (See: http://www.yhpho.org.uk/diabetes_commissioning.aspx (last accessed 26/07/07).

²⁴ NHS Institute for Innovation and Improvement. (2007). High impact changes for practice teams. NHS Institute / The Improvement Foundation.

- Encourage self-care and patient education; and
- Keep hospital admission to a minimum.

Developing the skills of other health professionals can also have a significant impact on the way diabetics are managed acutely, thereby preventing the need for unscheduled hospital admission, for example, the use of referral pathways and the use of emergency care practitioners (ECPs) by ambulance services²⁵.

New developments in health technology are likely to have a major impact on the treatment and outcomes associated with diabetes over the next 10 years. A United States National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) recently produced a report on recent advances and emerging opportunities for diabetes. This identifies the following key emerging developments:

- New imaging technology to monitor Type I disease progression and facilitate understanding of the molecular underpinnings of disease onset (leading to novel prevention and treatment strategies);
- Production of islet cells for future cell therapies;
- Greater understanding of the biologic basis of Type II disease susceptibility (again, leading to novel prevention and treatment strategies); and
- Improved resources for patient education to promote self-management, enabling better compliance / control, thus reducing complications.

²⁵ Walker A, James C, Bannister M, Jobes E. (2006). Evaluation of a diabetes referral pathway for the management of hypoglycaemia following emergency contact with the ambulance service to a diabetes specialist nurse team. *Emergency Medicine Journal* 2006; 23: 449-451. doi:10.1136/emj.2005.028548

Useful resources

Department of Health

DoH guidance on diabetes, including the National Service Framework:
<http://www.dh.gov.uk/PolicyAndGuidance/HealthAndSocialCareTopics/Diabetes/fs/en>

The Department of Health's Diabetes Commissioning Toolkit can be found at:
http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_4140284

National Diabetes Support Team

The work and publications of the National Diabetes Support Team are a valuable source of material. This can be found at:
<http://www.diabetes.nhs.uk/>

DAFNE

Contains up-to-date information on Dose Adjustment For Normal Eating for both people living with Type 1 diabetes and healthcare professionals.
www.dafne.uk.com/

The NHS Information Centre

The NHS Information Centre supervises a number of national clinical audits. This includes diabetes. The latest available national audit is available at:

<http://www.ic.nhs.uk/statistics-and-data-collections/audits-and-performance/national-clinical-audits>

National Institute for Health and Clinical Excellence (NICE)

NICE guidance on diabetes can be found at:
<http://guidance.nice.org.uk/topic/endocrine/?node=7096&wordid=77>

NICE guidance on patient education models for diabetes can be found at:
<http://www.nice.org.uk/guidance/TA60>

NICE also provides a series of web-based commissioning guides, designed to support clinical redesign. This currently includes foot care services for diabetics: <http://www.nice.org.uk/page.aspx?o=commissioningGuides>

National Library for Health

In addition to the National Service Framework and supporting documents for diabetes, guidelines on specific aspects of diabetic care (foot disease, hypertension, retinopathy, etc) can be found at the National Library for Health's Clinical Knowledge summaries:

http://www.cks.library.nhs.uk/clinical_knowledge

Diabetes UK

Diabetes UK website can be accessed at: <http://www.diabetes.org.uk/>

Diabetes UK highlights examples of clinical pathways and good practice initiatives with summaries of specific schemes for the early identification and treatment of diabetes. This can be found at:

http://www.diabetes.org.uk/Professionals/Shared_Practice/

Other UK

The Department of Diabetes and Endocrinology at the Leicester Royal Infirmary has established a website that encompasses all the diabetic services available to the public within the University Hospitals of Leicester NHS Trust, Primary Care Trusts (PCT's) and the NHS within Leicestershire. This website provides access to recent published research and reports on diabetes care. <http://www.leicestershirediabetes.org.uk/>

Enfield PCT have established a Specialist Clinical Assessment Service (SCAS) in 2006 with the aim of ensuring that patients see the right clinician first time, including diversion to non-hospital based specialist services. This service covers dermatology, musculoskeletal, ENT and diabetes. A summary of this initiative, with links, can be found on the NHS Network website:

http://www.networks.nhs.uk/uploaddb/commissioning/201_enfield_specialist_clinical_assessment_service.doc

The NHS Institute's 'Closer to Home' work stream provides examples of recent developments. This includes a summary paper on a project in Central Manchester in diabetes:

http://www.institute.nhs.uk/care_outside_hospital/care/case_studies.html

Appendix 1 Building blocks of diabetes care, 2006

Prevention and Early Detection

Health Promotion	Public Education	High-Risk Groups
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Chronic Disease Management – Care, Monitoring and Treatment

Information, Education and Empowerment (A)	Heart Disease and Stroke (A)	Eye Care (A)	Initial and Continuing Care	
Foot Care (B)	Psychological Support (B)	Kidney Problems	Neuropathy (Nerve Problems)	Diabetic Emergencies and Elective Care

Specific Groups

Type 1 Diabetes (B)	Children and Young People (B)	Minority Ethnic Groups (B)
Pregnancy and Sexual Health		Vulnerable Groups

Planning and Managing Services

Strategy, Leadership and Teamworking(A)	Education and Training for Professionals (A)	IM&T and Diabetes Registers (A)	Research and Development (B)
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Implementation

Implementation and Monitoring (A)

Community Issues

Community Issues – Issues involving other agencies
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Source: NHS Scotland. (2006). Diabetes Action Plan.