

# SWEETWISE: developing a multi-professional approach to diabetes mellitus

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The formation of a local joint professional network (LJPN) in Northamptonshire has led to a joint Continuing professional development initiative and an audit project to determine the take up of annual health checks by patients with diabetes mellitus with dentists, optometrists, pharmacists as well as the usual check with the General Medical Practice team. The findings showed that a significant number of patients (29–50%) do not access available dental, optometry and pharmacy advice. Better collaboration between the professions has the potential to improve health outcomes in diabetes mellitus and other areas where lifestyle modification reduces adverse health risks. A patient advice card (SWEETWISE) was developed by the group and could be used to help educate patients and health professionals.

**Key words:** advice; collaboration; dentist; diabetes; multi-professional; pharmacist

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## Introduction

Diabetes mellitus is an increasingly common chronic condition affecting over 3 million people in the United Kingdom (Diabetes UK, 2012) with a huge burden of workload and cost in dealing with the complications estimated as 10% of the NHS budget (Kanavos *et al.*, 2012). Medical teams have taken a lead in managing and monitoring care but there has been limited cross-professional work to look at and ensure the use of dentists, optometrists and pharmacists to help optimise health outcomes in diabetes.

The formation of a local joint professional network in Northamptonshire with representatives from the local medical, pharmacy, optometry and dental committees in 2011 provided an opportunity

for the professions to work together. Patients with diabetes were selected as an important group that could be benefit from collaboration.

During October 2012, the Northamptonshire LJPN held a joint Continuing professional development meeting entitled ‘Diabetes: up close and personalised: delivering tailored care to the type 2 diabetic patients to optimise treatment’. This was well attended with 80 participants (20 from each profession). Participants agreed that there is difficulty in motivating patients to take their condition seriously and manage it appropriately. Patients often describe themselves as having ‘a bit of diabetes’ or ‘mild’ diabetes. The need for a consistent message across the professions was emphasised and the LJPN agreed to develop a patient advice card that highlights the key messages that will enable them to stay healthy and avoid the long-term complications of diabetes. This ambition fits well with the expectations of the Diabetes Commissioning Toolkit (Department of Health,

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2006), which describes the expected best practice for the prevention, detection and management of diabetes. It is clear that when a person is diagnosed with diabetes the initial management should include education regarding and the prevention of long-term co-morbidities.

Guidelines for the management of diabetes have tended to focus on the role of the medical teams (primary and secondary care) and while there is some reference to the role of optometrists and dentists there has been little UK research looking at the take-up of annual health checks by diabetes patients across the different professions. Pharmacists clearly have regular contact with patients collecting diabetic medication but the potential to use this contact effectively has not been fully exploited.

A questionnaire survey of patients attending General Medical Practice (GMP) diabetic clinics (Bowyer *et al.*, 2011) found that 80% of patients visited a dentist at least once a year but the authors acknowledged that the patients responding to the four-page questionnaire (response rate 38%) may have been biased towards patients with a greater interest in oral healthcare or those with poorer oral health outcomes. We were unable to find any similar data using information collected from patients attending pharmacies or dental practices. LJPN group decided to undertake an audit to determine quantitatively if there was an unmet need in this area locally.

The importance of oral health in diabetes is increasingly being recognised in the research literature. Saremi *et al.* (2005) found that periodontal disease is a strong predictor of mortality from ischaemic heart disease and diabetic nephropathy with type 2 diabetes. The effect of periodontal disease was in addition to the effects of traditional risk factors for these diseases. There is evidence of a bidirectional link between periodontal disease and diabetic glycaemic control (Dunning, 2009; Chapple and Genco, 2013). A Cochrane systematic review (Simpson *et al.*, 2010) found evidence of improvement in metabolic control in people with diabetes, after treating periodontal disease with mechanical periodontal therapy and oral hygiene education but did highlight a need for larger randomised trials in this area.

Pharmacists have played an increasing role in the United Kingdom and have been encouraged to do so by initiatives such as Medicines Use Reviews

(MURs; Royal Pharmaceutical Society, 2011) and the New Prescription Service where they can help ensure patients are using their medication optimally, for example, taking them at the right time, checking adherence and side effects and helping to identify interactions. As well as these initiatives pharmacists are readily available to provide medication and lifestyle advice but the frequency of access to advice by patients is not clear.

In GMP, performance management systems such as the Quality and Outcomes Framework (QOF) monitor the uptake of retinal screening but not whether the patient has had a comprehensive eye examination to monitor changes in refraction and to detect other eye diseases such as glaucoma. Ideally diabetic patients should see an optician once a year (Department of Health, 2002; RNIB, 2007) as well as having their retinopathy screening by digital photography. Retinal screeners do recommend patients to have annual check but there has been no systematic monitoring of whether patients are having checks to look for non-retinopathy complications. Examples of abnormalities, which might be missed by a retinal photography-based screening programme includes corneal ulcers. Diabetic patients have higher intraocular pressures than the normal population, especially those treated with insulin, but evidence of an association between primary open-angle glaucoma and diabetes is conflicting (Mitchell *et al.*, 1997). Data from the Framingham and other eye studies indicate a three- to fourfold increased prevalence of cataract in patients with diabetes under 65 years, and up to a twofold excess prevalence in patients above 65 years (Ederer *et al.*, 1981; Klein *et al.*, 1985).

Acute disc oedema (diabetic papillopathy) affects patients in their second to fourth decades. It is often bilateral and usually causes no symptoms (Benson *et al.*, 1988).

The wide range of potential ophthalmic complications means that optometrists are well placed to help identify problems early and preserve vision through comprehensive checks and patient education. Patients may perceive, however, that they only need to attend a retinal screening exam – often purely a photographic assessment with no clinical interventions or advice. If this perception can be challenged then optometrists can play a complementary role and use the potentially powerful incentive to retaining sight as a motivation for improved control of risk factors.

The group decided to investigate the extent of the potential problem of poor take up of health checks within the four professions by undertaking an audit using a simple questionnaire survey (Appendix 1).

## Method

A set of audit criteria were developed through discussion of the relevant professional standards for each profession.

Audit criteria agreed:

- (1) All patients with diabetes should have an annual eye examination by an optician.
- (2) All patients with diabetes should have an annual dental check.
- (3) All patients with diabetes should have an annual medication review by a pharmacist.
- (4) All patients with diabetes should have an annual review by doctor/nurse.

Proposed audit standards: in the absence of a nationally agreed baseline, the audit standards were agreed by the group making allowance for patients who decline or are unable to attend:

- (1) 90% of patients should have an annual review by an optician;
- (2) 90% of patients should have an annual review by a dentist;
- (3) 80% of patients should have a medication review with a pharmacist;
- (4) 95% of patients should have an annual review with a doctor or nurse.

A data collection questionnaire was devised to establish the current take up of the reviews by

diabetic patients with different healthcare professionals (Appendix 1). The steering group distributed the questionnaires through their professional networks and advised the pharmacy and dental and optometrist practice sites who agreed to take part to ask patients taking diabetes medication who attended over a two-week period in June 2013 to complete the questionnaire.

## Results

A total of 182 questionnaires were completed and the results are summarised below against the agreed audit standards (Table 1).

The results show that we did not meet the agreed audit standard in all professions with doctor/nurse being the closest (89%) to the audit standard, which is in line with this area being performance managed with the QOF framework.

For dentists and opticians, the results show patients were being reviewed at 20% below the audit standard of 90% reviewed within the past year. However, there was 93% uptake of an optician check within the past two years leaving 7% of patients who had not had a comprehensive eye examination in the past two years.

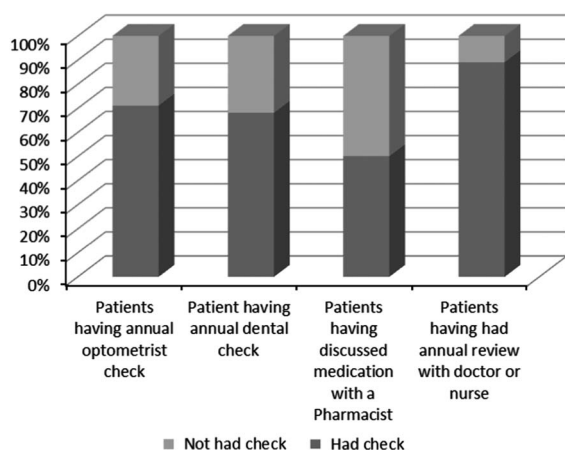
A total of 68% of patients had had a dental check within the past year going up to 83% in the past two years but still leaving 17% who had not had a check in past two years.

Our data suggested that within the past year: 29% had NOT had a check with an optician; 32% had NOT had a check with a dentist; 50% had NOT discussed their medication with a pharmacist; 11% had NOT had a review with a doctor/nurse (Figure 1).

**Table 1** Overall results

Check-up or review question	Audit standard	Within the past year	Between 1 and 2 years	Over 2 years	Total number of questionnaires
Have you been to see an optician?	90%	129 ( <b>71%</b> )	40 ( <b>22%</b> )	13 ( <b>7%</b> )	182
Have you had a dental check?	90%	124 ( <b>68%</b> )	28 ( <b>15%</b> )	30 ( <b>17%</b> )	182
Have you discussed your diabetic medication with a pharmacist?	80%	92 ( <b>50%</b> )	26 ( <b>15%</b> )	64 ( <b>35%</b> )	182
Have you had an annual review for your diabetes with a doctor/nurse?	95%	163 ( <b>89%</b> )	16 ( <b>9%</b> )	3 ( <b>2%</b> )	182

Bold values represent the percentage of patients who replied positively to question about their last check with professional stated.



**Figure 1** Results summary: patients having annual checks

The questions below were asked as supplementary information in only 132 questionnaires (not included in first 50 questionnaires circulated).

	Yes	No	
Diabetes is under insulin control	47	85	132
	36%	64%	
Would you like more information about diabetes	46	86	132
	35%	65%	

This supplementary information is suggestive that patients with diabetes mellitus would benefit from more information about their condition, its management and the health benefits from attending other healthcare professionals.

### Limitations of this audit project

The small sample size and the selection of participants from specific sites in Northamptonshire might affect generalisability or transferability of this data. Other areas with different configurations may have differing results but we are not aware of other similar published data. Patients with diabetes mellitus not taking medication were excluded from the audit; the group felt they would be a small minority of the patients with type 2 diabetes.

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## Discussion

The results confirmed there is an unmet need and room for improvement in the uptake of health checks with the professions surveyed. The data shows the lowest uptake of advice from pharmacy (50%), which may well indicate a perception of pharmacy as ‘dispenser of medicines’ rather than a provider of care. This is large untapped resource, which could help assist the NHS in care provision for these patients who are visiting pharmacies regularly to collect their medications and their already contractual mechanisms such as MURs for this group to be targeted (Royal Pharmaceutical Society, 2011).

The Royal Pharmaceutical Society’s report ‘Now or Never; Shaping the future of pharmacy’ highlights how pharmacy is currently underutilised in the delivery of care both in long-term condition and in urgent care (Royal Pharmaceutical society, 2013a, 2013b). As the number of pharmacists is increasing while GP numbers dwindle, it would make sense to use this untapped resource. The report highlights some of the steps needed to achieve this including appropriate IT access (with consent) to a shared medical record.

A toolkit is available (Department of Health/Diabetes UK, 2006) demonstrating how community pharmacy could be integrated into the care of patients with diabetes. Pharmacists can have a role in identifying early disease as well as aiding medicines optimisation, monitoring patients and highlighting those at high risk of complications. Delivering patient education would be a key part of their role.

The audit showed nearly one-third of patients were not having an annual comprehensive eye examination with an optometrist. There may be more who had not accessed a full eye examination as this audit questionnaire may not have been accurate enough to distinguish those who went for retinopathy screening only. The World Council of Optometry (2014) recently highlighted that optometrists could contribute to diabetes care by increasing awareness and understanding of the disease. They could identify high risk patients and even offer screening on site. They have key role in preserving vision and ensuring timely intervention. Patients may be unaware of the level of training of optometrists and the importance of their lifestyle choices to eventual visual loss.

This baseline audit has confirmed the need for more work to be done to ensure diabetic patients

get regular checks. It adds to the recent Diabetes UK checklist for the 15 standards of care a diabetic patient should expect and may help ensure the other standards are delivered with greater multi-professional input (Diabetes UK, 2014).

The project has also shown the potential for multi-professional working and improving patient outcomes by implementing best practice guidance across the community. The NHS is under increasing pressure to deliver better outcomes with fewer resources so the potential to engage other professionals in pharmacy, optometry and dentistry for delivering health care is underused.

The audit project was developed as a result of cross-professional collaboration between the professions of medicine, dentistry, optometry and pharmacy. This process resulted in better understanding across the professions of what we can all offer to patients to improve health outcomes. There is potential benefit for health outcomes if we can use the resources of all four professions for key health messages, both in treating established diseases and prevention of disease with lifestyle advice. It would also be useful to engage further with the Local Authorities and Public Health to agree key interventions and co-ordinated messages to reduce risks of adverse health outcomes; supporting the 'Making Every Contact Count' agenda.

The LJPN has developed a patient advice card encouraging a multi-professional approach to diabetes (Appendix 2), which may improve the uptake of regular checks with health professionals. The audit data could be used to support a business case for improving public and professional awareness for these checks using this card and would complement national and regional initiatives to improve the care of diabetic patients. NHS England recently published its 'Action for Diabetes' (NHS England, 2014), which aims to describe the care patients with Diabetes should receive and includes a clear call for more multi-professional working within the 'House of Care' model. Part of developing this does need to engage patients with simple accessible guidance and the use of all the primary care professions increases the capacity to deliver care at a time when core services are quite stretched. The use of this advice card could help engage patients with clear messages about their condition but also widen their awareness of the wider role of pharmacists, optometrists, dentists as well as their usual healthcare providers, their General practice.

The commonly used NICE (2008) and SIGN guidelines make no mention of the role of dentists in managing diabetes mellitus, which is surprising given the evidence of the links in the literature between poor diabetic control and periodontal disease and also the links between this and poor outcomes in diabetes.

The Diabetes UK guideline does make reference to the importance of dental health (Diabetes UK, 2013) and quotes that diabetics are three times more likely to experience dental problems (gum disease, tooth decay, dry mouth) and that this is partly due to the high blood glucose levels. Longer term poor diabetic control can also lead to vascular changes making dental infection more likely.

While the UK medical guidelines (NICE) pay little attention to oral health in diabetes a useful guideline summarising the evidence base was put together by the International Diabetes Federation (IDF) working with the World Dental Federation. This guideline (International Diabetes Federation, 2009) points out:

'Maintenance of proper oral hygiene for good oral health is an accepted part of the normal recommendations for a healthy lifestyle. Poor oral hygiene is associated with gingivitis, which can progress to more severe infection and inflammation leading to periodontitis. Infectious disease is known to be more common in people with diabetes if blood glucose control is poor, and inflammation is known to be associated with a decrease in insulin sensitivity and thus potentially a worsening of blood glucose control. Both type 1 diabetes and type 2 diabetes carry a high burden of cardiovascular disease (CVD), and indeed it is the principal adverse outcome in type 2 diabetes. This is associated with increased levels of inflammatory markers, which may or may not contribute to CVD, but are believed to do so in some other conditions such as rheumatoid arthritis, in which treatment of the inflammation appears to reduce the risk of CVD. These observations raise the question of interactions between diabetes and the inflammatory process in periodontitis'.

After reviewing the evidence base and various national and international guidelines they

proposed the following recommendations on clinical care for people with diabetes:

- Enquire annually as to whether each person with diabetes follows local recommendations for day-to-day dental care for the general population, and (where access permits) attends a dental professional regularly for oral health check-ups.
- Enquire at least annually for symptoms of gum disease (including bleeding when brushing teeth, and gums that are swollen or red).
- In those people not performing adequate day-to-day dental care, remind them that this is a normal part of diabetes self-management, and provide general advice as needed. Advise those not attending for regular dental check-ups on the importance of doing so (where access permits).
- In those people with possible symptoms of gum disease, advise them to seek early attention from a dental health professional.
- Education of people with diabetes should include explanation of the implications of diabetes, particularly poorly controlled diabetes, for oral health, especially gum disease.

We would recommend the next update of the Diabetes Mellitus NICE guideline includes reference to the importance of oral health and ensure that non-dental health professionals are aware of the importance of this. The potential role of pharmacists and optometrists in improving outcomes of patients with diabetes should also be better recognised.

We would recommend further qualitative research in this area to explore the views of patients in accessing different health professionals and also the effectiveness of this approach in improving health outcomes.

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## References

**Benson, W.E., Brown, G.C. and Tasman, W.** 1988. *Diabetes and ocular complications*. Philadelphia: WB Saunders, 116–17.  
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- Bowyer, V., Sutcliffe, P., Ireland, R., Lindenmeyer, A. and Gadsby, R.** 2011: Oral health awareness in adult patients with diabetes: a questionnaire study. *British Dental Journal* 211, E12.
- Chapple, I.L. and Genco, R.** 2013: Diabetes and periodontal diseases: consensus report of the Joint EFP/AAP Workshop on Periodontitis and Systemic Diseases. *Journal of Clinical Periodontology* 40, S106–112.
- Department of Health.** 2002: Memorandum of understanding between Department of Health and Association of Optometrists and Federation of Ophthalmic and Dispensing Opticians on frequency of sight tests. Retrieved 1 December 2014 from [http://www.aop.org.uk/uploads/uploaded\\_files/GOS/memorandum\\_on\\_frequencies.pdf](http://www.aop.org.uk/uploads/uploaded_files/GOS/memorandum_on_frequencies.pdf).
- Department of Health/Diabetes UK.** 2006: Diabetes Commissioning Toolkit. Gateway reference 7304. [http://www.diabetes.org.uk/upload/Professionals/NHS\\_commissioning\\_toolkit\\_diabetes\\_2d.pdf](http://www.diabetes.org.uk/upload/Professionals/NHS_commissioning_toolkit_diabetes_2d.pdf)
- Diabetes UK.** 2012: Prevalence report. Retrieved 1 December 2014 from [http://www.diabetes.org.uk/About\\_us/What-we-say/Statistics/Diabetes-prevalence-2012/](http://www.diabetes.org.uk/About_us/What-we-say/Statistics/Diabetes-prevalence-2012/).
- Diabetes UK.** 2013: Guidance on dental health. Retrieved 1 December 2014 from [http://www.diabetes.org.uk/Guide-to-diabetes/Introduction-to-diabetes/Other\\_associated\\_conditions/Dental-health/](http://www.diabetes.org.uk/Guide-to-diabetes/Introduction-to-diabetes/Other_associated_conditions/Dental-health/).
- Diabetes UK.** 2014: Checklist for the standard of care a diabetic patient should expect. Retrieved 1 December 2014 from <http://www.diabetes.org.uk/Guide-to-diabetes/Monitoring/15-healthcare-essentials/>.
- Dunning, T.** 2009: Periodontal disease – the overlooked diabetes complication. *Nephrology Nursing Journal* 36, 489–95.
- Ederer, F., Hiller, R. and Taylor, H.R.** 1981: Senile lens changes and diabetes in two population studies. *American Journal of Ophthalmology* 91, 381–95.
- International Diabetes Federation (IDF).** 2009: Diabetes and oral health guideline. Retrieved 1 December 2014 from <http://www.idf.org/guidelines/diabetes-and-oral-health/guideline>.
- Kanavos, P., van den Aardweg, S., Schurer, W.** 2012: Diabetes expenditure, burden of disease and management in 5 EU countries, LSE report, January 2012.
- Klein, B.E., Klein, R. and Moss, S.E.** 1985: Prevalence of cataract in a population-based study of persons with diabetes mellitus. *Ophthalmology* 92, 1191–96.
- Mitchell, P., Smith, W., Chey, T. and Healey, P.R.** 1997: Open-angle glaucoma and diabetes: the Blue Mountains eye study, Australia. *Ophthalmology* 104, 712–18.
- NHS England.** 2014: Action for diabetes. Retrieved 1 December 2014 from <http://www.england.nhs.uk/wp-content/uploads/2014/01/act-for-diabetes-31-01.pdf>.
- NICE.** 2008: Type 2 diabetes: the management of type 2 diabetes. Retrieved 1 December 2014 from <http://guidance.nice.org.uk/CG66/Guidance/pdf/English>.
- RNIB.** 2007: Report ‘Older people and eye tests’. Retrieved 1 December 2014 from <http://www.rnib.org.uk/sites/default/files/Older%20people%20and%20eye%20tests%20Campaign%20report.pdf>.

