Alphabet Strategy for diabetes care: A multi-professional, evidence-based, outcome-directed approach to management

James D Lee, Ponnusamy Saravanan, Vinod Patel

James D Lee, Vinod Patel, Diabetes and Endocrinology Centre, George Eliot Hospital NHS Trust, CV10 7DJ Nuneaton, United Kingdom

Ponnusamy Saravanan, Vinod Patel, Warwick Medical School, University of Warwick, CV4 7AL Coventry, United Kingdom

Correspondence to: Dr. Vinod Patel, Diabetes and Endocrinology Centre, George Eliot Hospital NHS Trust, College Street, CV10 7DJ Nuneaton, Warwickshire, United Kingdom. vinod.patel@warwick.ac.uk
Telephone: +44-24-76865212
Fax: +44-24-76865409

Abstract

With the rising global prevalence in diabetes, healthcare systems are facing a growing challenge to provide efficient and effective diabetes care management in the face of spiralling treatment costs. Diabetes is a major cause of premature mortality and associated with devastating complications especially if managed poorly. Although diabetes care is improving in England and Wales, recent audit data suggests care remains imperfect with wide geographical variations in quality. Diabetes care is expensive with a sizeable amount of available expenditure used for treating the complications of diabetes. A target driven, long-term, multifactorial intervention in patients with type 2 diabetes has been shown to reduce mortality and morbidity. The alphabet strategy is a novel approach to effective diabetes care provision, aiming to address patient education and empowerment, provide consistent comprehensive care delivered in a timely fashion, and allowing multidisciplinary team work.

Key words: Alphabet strategy; Diabetes care management; Checklist; Multifactorial intervention; Chronic disease management

Core tip: The alphabet strategy is a novel approach to effective diabetes care provision, using a checklist approach to delivering multifactorial intervention. The aim is to address patient education and empowerment, provide consistent comprehensive care delivered in a timely fashion, and allow multidisciplinary team work. In this article, we demonstrate evidence for its clinical effectiveness.

INTRODUCTION

The increasing global prevalence of diabetes has been described by many as an current epidemic[1]. The causes are complex but they are largely due to adverse lifestyle factors such as obesity and physical inactivity, as well as poverty. Although no country will be immune from the epidemic, most of the increase is expected to occur in low and middle income countries that are poorly set-up to manage the crisis[2]. Diabetes care is expensive, with current direct costs estimated to be £9.8 billion in the United Kingdom, or approximately ten percent of the total healthcare expenditure. Treatment of complications account for 80% of this expenditure[3].

No short-term cure exists for diabetes. Patients need to work closely with multidisciplinary teams to control risk factors in order to prevent or delay the advent of recognised complications. However diabetes care management remains imperfect with substantial variations in care quality. Data from the National Diabetes Audit from England and Wales found that on average under two-thirds of people received all eight recommended healthcare checks, with a range of performance from 18% to 78%[4]. Such variation in routine healthcare performance also exists at a geographical level. For target care process achievement, only an average of 61% and 60% of subjects achieved their blood pressure and cholesterol goals respectively. Internationally, our own Global Alphabet Strategy Implementation Audit project across 45 single centres in 28 countries demonstrated considerable variations in care quality closely linked to each country's economic prosperity and healthcare spend[5].

Our objective from the outset was to develop a diabetes strategy that would address the variation in care ensuring "simple things are done right all the time", promoting a consistent approach to management[6]. It would involve the participation of patients in their own care, especially for their education and empowerment in disease management issues. The strategy had to be applicable in all clinical settings, allowing multidisciplinary teamwork across primary and secondary care interfaces. Finally, it had to be evidence-based, and simple to use and recall for both healthcare professionals and patients.

THE ALPHABET STRATEGY

Our framework is called the alphabet strategy, a mnemonic-based checklist incorporating the core components for comprehensive diabetes care[7]. Its elements consist of: (1) Advice, specifically on avoidance of smoking, encouraging regular physical activity and judicious dietary choices leading to optimal weight attainment, and individualised recommendations such as influenza vaccination; (2) Blood pressure, with targets guided by co-morbidities; (3) Cholesterol measurement, with targets determined by co-morbidities - Creatinine/microalbuminuria evaluation; (4) Diabetes glucose control, with target HbA1c individualised according to co-morbidities and aiming for avoidance of hypoglycaemia; (5) Eye exam, performed yearly, with prompt referral for intervention as clinically indicated; (6) Foot exam, conducted at least yearly, with prompt appropriate referral as indicated; and (7) Guardian drugs: opportune use of aspirin, ACE inhibitors or angiotensin receptor blockers, and statins protective against cardiovascular disease and other diabetes complications.

A substantial diabetes evidence base exists for each element of the checklist[8-11]. Overall, the use of a multifactorial targeted intervention such as that used in the Steno-2 study resulted in significant reductions in macrovascular and microvascular complications as well as cardiovascular mortality[12].

The aim of this paper is to outline the evidence-base and the potential for use of the alphabet strategy in clinical practice. We hope that this will lead to a reduction in diabetes complications and provide an education strategy for both patients and healthcare professionals in diabetes care.

CLINICAL IMPACT - PRACTICE OF EVIDENCE-BASED MEDICINE 1 AUDIT

To determine the clinical impact of the alphabet strategy in the care of our patients with type 2 diabetes, pre and post checklist implementation audits were conducted on over 400 consecutive patients attending our diabetes outpatient clinic[13].

The average age of our cohort was 58 years, with mean duration of diabetes being 6 years. 54% were male. Ethnically, 87% were White Caucasian, 11% of South Asian (Indo-Asian) origin, and the remainder being of African-Caribbean. The average follow-up period between the two audits was 5 years.

Use of alphabet strategy resulted in significant improvements in average blood pressure, mean total and HDL cholesterol, performance of eye and foot examinations, and uptake of guardian drugs. Ninety-seven percent of subjects on lipid lowering agents in the post implementation audit were on statins. Significant deterioration was seen in glycaemic control over the mean 5 year follow-up, which can be partly explained by the effect of progressive ageing on glycaemic control[8]. When adjusted for duration of diabetes, an improvement in HbA1c was seen. No significant change was seen in the number of smokers (Table 1).

CONTINUED BENEFITS - PRACTICE OF EVIDENCE-BASED MEDICINE 2

A repeat audit of subjects with T2DM attending the clinic was performed two years later to determine if the

Table 1 Effect of the Alphabet Strategy on change in achievement of target care processes

	Alphabet strategy	Pre implementation	Post implementation	*P* value
A	Smoking (%)	18.2 (77)	15.7 (66)	NS
B	Blood pressure (mmHg)	146/82	140/76	< 0.0001
C	Total cholesterol (mmol/L)	5.7	4.9	< 0.0001
	HDL cholesterol (mmol/L)	1.1	1.39	< 0.001
D	HbA1c (%)	7.9	8.3	< 0.0001
E	Eye examination (%)	85.0	95.5	< 0.001
F	Foot examination (%)	69.8	83.5	< 0.001
G	Aspirin (%)	29.0	83.5	< 0.001
	ACEI/ARB (%)	32.0	73.0	< 0.001
	Lipid lowering (%)	16.8	55.0	< 0.001

NS: Not significant.

Table 2 Comparison of achievement of Alphabet Strategy components between practice of evidence-based medicine audits

	Alphabet strategy	POEM 1 $n = 420$	POEM 2 $n = 1071$	*P* value
A	Smoking status (%)	15.5	14.7	0.83
B	Blood pressure (mmHg)	141/77	136/76	0.007
C	Total cholesterol (mmol/L)	4.9	4.5	< 0.001
	LDL cholesterol (mmol/L)	2.5	2.4	< 0.001
	Creatinine (mmol/L)	109	105	0.036
D	HbA1c (%)	8.3	7.9	0.09
E	Eye examination (%)	95.5	97.1	0.72
F	Foot examination (%)	83.5	97.3	< 0.001
G	Aspirin (%)	83.5	88.0	0.20
	ACEI/ARB (%)	73.0	74.4	0.75
	Lipid lowering (%)	55.0	73.4	< 0.001

POEM: Practice of evidence-based medicine.

Table 3 Clinical trial standards of United Kingdom Prospective Diabetes Study and Steno-2 compared to those in practice of evidence-based medicine studies

Variable	Steno-2 (intensive arm)	UKPDS	Alphabet strategy	
			POEM	POEM2004
Systolic BP (mmHg)	⩽ 130	⩽ 144	⩽ 140	⩽ 130
Diastolic BP (mmHg)	⩽ 80	⩽ 82	⩽ 80	⩽ 80
HbA1c (%)	⩽ 6.5	⩽ 7	⩽ 7	⩽ 7
Cholesterol (mmol/L)	⩽ 4.5	NA	⩽ 5	⩽ 4

POEM: Practice of evidence-based medicine; UKPDS: United Kingdom Prospective Diabetes Study.

Table 4 Percentage of practice of evidence-based medicine cohort attaining trial standards compared to original study treatment arms

	Intensive arm	POEM 1 post implementation	POEM 2	*P* value (intensive *vs* POEM 2)
Steno-2				
SBP ⩽ 130 mmHg	45%	34%	36%	0.07
DBP ⩽ 80 mmHg	70%	67%	67%	0.51
TC ⩽ 4.5 mmol/L	72%	36%	54%	< 0.001
HbA1c ⩽ 6.5%	15%	13%	15%	1.000
Aspirin	73%	83%	88%	< 0.001
Statin	71%	52%	69%	0.66
ACEI	66%	66%	58%	0.09
ARB	39%	10%	20%	< 0.001
Either ACEI/ARB	58%	73%	74%	0.001
UKPDS				
SBP ⩽ 144 mmHg	50%	58%	73%	< 0.001
DBP ⩽ 82 mmHg	50%	73%	74%	< 0.001
HbA1c ⩽ 7%	50%	22%	29%	< 0.001

POEM: Practice of evidence-based medicine; SBP: Systolic blood pressure; DBP: Diastolic blood pressure; UKPDS: United Kingdom Prospective Diabetes Study.

use of the AS continued to provide meaningful clinical benefits. Data on over 1000 subjects was collected[14].

Performance of each essential care process according to the alphabet strategy was over 92%. Comparison of target care process achievement with the original Practice Of Evidence-based Medicine (POEM) audit is shown in Table 2. Improvements in all AS measured components were seen (Table 1).

ACHIEVING CLINICAL TRIAL STANDARDS IN ROUTINE PRACTICE

The clinical outcomes delivered by the alphabet strategy are comparable to those achieved in published landmark studies[15]. Blood pressure, glycaemic and cholesterol targets in the Steno-2 study, The United Kingdom Prospective Diabetes Study (UKPDS), and the POEM audits are shown in Table 3. Table 4 shows

the proportion of people achieving these targets in the original studies compared to those in the POEM audits.

The percentage of POEM subjects reaching trial targets was comparable to those in the UKPDS and Steno-2 for the majority of categories. Significantly less people reached the total cholesterol target compared to Steno-2, but in a re-audit in 2013, 75% of our subjects achieved this goal. There were fewer people on ARBs, but individuals using either ACEI or ARB were higher than for Steno-2.

Almost three quarters of the POEM 2 population reached the UKPDS blood pressure target, but achieving an HbA1c of ⩽ 7% was more difficult. Indeed in the recent National Diabetes Audit, centres with over 50% of their submitted cohorts achieving the slightly higher target HbA1c of ⩽ 7.5% numbered only 10 out of 77 centres[16]. However, it must be understood that our hospital provides secondary care for people with diabetes. Therefore our patient population is predominantly patients that cannot be managed in

Table 5 Change in care process performance following implementation of the alphabet strategy in a low-resource diabetes clinic

	Elements	Pre implementation	Post implementation	*P* value
A	Body mass index	99%	99%	NS
	Smoking status	99%	99%	NS
	Smoking cessation	100%	100%	NS
B	Blood pressure	99%	99%	NS
C	Total cholesterol	60%	99%	< 0.001
	Lipid profile	10%	64%	< 0.001
	Creatinine	5%	49%	< 0.001
	Proteinuria	48%	93%	< 0.001
D	Fasting and postprandial glucose	41%	97%	< 0.001
E	Eye examination	98%	100%	NS
F	Feet examination	95%	100%	NS
G	Aspirin therapy	6%	71%	< 0.001
	ACEI/ARB therapy	7%	57%	< 0.001
	Statin therapy	5%	38%	< 0.001
	All three	2%	20%	< 0.001

NS: Not significant.

primary care alone.

NATIONAL DIABETES AUDIT 2011/12 - SECONDARY CARE UNITS

In this national audit, the clinical effectiveness of the alphabet strategy was reflected in the beneficial showing of George Eliot Hospital in comparison with other hospitals. Performance of each of the seven out of eight NICE recommended processes occurred in 100% of our submitted cohort, a feat that no other trust achieved. Overall, 85.7% of the submitted cohort received all eight recommended care processes, placing it third out of seventy seven. For target care process achievement, George Eliot scored above average in all categories other than for HbA1c $\leqslant$ 6.5%[16].

IMPLEMENTATION IN A NON-HIGH INCOME COUNTRY

A beneficial clinical change in care process performance was also demonstrated when the alphabet strategy was applied to a resource poor setting in India. An outpatient diabetes clinic run by a single diabetologist with the aid of a dietician and a nurse was selected for the study. The checklist was adapted for use to the limited local resources. Pre and post-implementation audits were conducted on 100 randomly chosen patients with type 2 diabetes. Principle improvements occurred in the assessments of cholesterol, creatinine and proteinuria, glycaemia, and the use of statins (Table 5).

QUESTIONNAIRE STUDY

As part of the Global Alphabet Strategy Implementation Audit project, a questionnaire study was performed to gauge the opinions of healthcare professionals and patients on the potential of the alphabet strategy as a management checklist, as a patient-held diabetes care plan, and an education tool. Completed forms were available from 44 single centres located in 27 countries.

Most of the respondents considered the alphabet strategy an evidence-based and practical tool (98% and 91% respectively replying positively). Eighty-five percent of respondents thought that its use would potentially improve outcomes in their clinical practice. Over 70% said they would be likely to adopt the checklist in their clinical practice, although just over half thought it could be applied in their economic background. The strategy was regarded as a useful instrument for patient education. Indeed, over two-thirds of patient responders suggested that patients themselves should use it. However, there were some concerns about the checklist's indirect costs: HbA1c, creatinine, and lipid profile assessments together with the cost of statin implementation are prohibitive in low resource countries, with the expense borne entirely by the patient in private healthcare systems.

CHECKLISTS - ENGAGEMENT IS KEY

Interest has been gathering in the use of checklists and care bundles as a means of improving healthcare quality and lowering patient risk. However, there are many issues associated with their application and adoption, particularly social and cultural difficulties[17]. After the adoption of the WHO Surgical Safety Checklist, several reports described a range of barriers including confusion regarding its proper use, lack of resource availability in low income countries, and individual personal beliefs and attitudes[18]. The solutions provided by checklists should not be considered magic bullets. Mere provision of the WHO checklist to hospitals did not culminate in immediate clinical benefits, but rather months of groundwork to organisational systems and personnel were required to aid effectual implementation[19].

The successful outcomes associated with the use of the alphabet strategy suggests it presents a technical solution to the complicated task of achieving effective diabetes care. Implementation of the alphabet strategy initially in our hospital trust was relatively uncomplicated. There was then one consultant diabetologist supported by an able diabetes team keen for patient-centred and evidence-based care. There now exists four consultant diabetologists, all with varying degrees of engagement with the alphabet strategy. Indeed a recent audit assessing care process performance showed considerable variation by consultant (Table 6).

Consultant A, the author of the alphabet strategy, achieved performance of all nine care processes in 80.8% of all patients directly seen. All other doctors faired significantly worse in performance of all care

Care process	Cons A/% n = 125	Cons B/% n = 132	Cons C/% n = 36	Cons D/% n = 101	Junior drs/% n = 86	Registrars/% n = 70
Smoking status	100	97.7	94.4	99	98.8	98.6
BMI	92.8	93.2	91.7	95	98.8	98.6
Blood pressure	100	100	100	100	100	100
Total cholesterol	100	100	100	100	98.8	100
Creatinine	100	100	100	100	100	100
Urine albumin creatinine ratio	87.2	78.8	75	82.2	74.4	78.6
HbA1c	100	100	100	100	100	100
Eye examination	97.6	98.5	97.2	99	97.7	97.1
Foot Examination	100	77.3	83.3	68.3	96.5	84.3
All care processes performed	80.8	59.1	55.6	51.5	73.3	67.1
P value all care processes *vs* Cons A (χ^2)	-	< 0.0001	< 0.0001	< 0.0001	0.057	< 0.0001

Table 6 Care process performance by consultant, registrars, and junior doctors

BMI: Body mass index.

processes, except interestingly for the junior doctors.

ALPHABET STRATEGY MATERIALS

Our healthcare education talks are centred around the alphabet strategy approach. A one-day alphabet strategy workshop has previously been delivered nationally in the United Kingdom and internationally under the auspices of the United Nations Development Programme in Bahrain (twice). Course evaluations have been consistently positive[20].

A series of posters and leaflets discussing each of the elements of the alphabet strategy have proved popular and effective in group and individual education. The education posters were also rated favourably in our questionnaire study by healthcare professional and patients. As a result, they have been translated into French, Somali, Telugu, and Gujarati. Other patient resources include a "patient passport" - a diabetes care plan in the alphabet strategy format that allows people to track their clinical and biochemical data and identify management targets. Culturally adapted materials ensure that the key messages of the alphabet strategy are relayed to members of the South-Asian (Indo-Asian) community residing in our locality. For Muslim patients, Ramadan advice leaflets prepare individuals on self-management issues during their month of fasting.

Finally, clinical letters based on the strategy communicating treatment plans to primary care have been developed to facilitate shared management.

CONCLUSION

When used appropriately, the alphabet strategy can consistently deliver excellent clinical outcomes comparable to trial standards in landmark studies. We achieved these benefits despite a considerable outpatient workload and low levels of human resources: the average patient was seen two to three times per year in our unit, approximating a total of 45 min with a healthcare professional. The positive

improvements with the checklist have been achieved because healthcare providers and patients all subscribe to one methodical approach to diabetes care.

We believe diabetes care, like all forms of healthcare provision, should be effective, professional, responsible, and accountable. Our philosophy for the alphabet strategy is that it should follow the "POETIC" vision: (1) Patient-focused, Public health centred to improve outcomes, and Professionally guided and inspired; (2) Outcome-based, delivering relevant clinical improvements based on real and assessable outcomes; (3) Evidence-based, rooted in clinical evidence, up to date, and influenced by local audit; (4) Team-focused, allowing multidisciplinary cooperation and intervention to improve patient care; (5) Integrated across primary and secondary care, and other related health services; and (6) Cost efficient, using limited resources appropriately.

The alphabet strategy concept is freely available and not under copyright. All materials (lecture slides, patient education posters, patient held care plans, Ramadhan advice leaflets, clinic letter template) are available in the public domain, free to download and use, and easily adaptable to local resources and requirements. All patients with diabetes should be offered the foremost healthcare that resources allow, with none being refused effective or affordable care or therapy. The alphabet strategy can deliver real clinical benefits in diabetes care and has the scope to be adopted extensively across different economies.

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