



A STRUCTURED RECORD TO IMPLEMENT THE NATIONAL GUIDELINES FOR DIABETES AND HYPERTENSION CARE

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Background. Guidelines to improve standards of care for hypertension and diabetes were disseminated by the National Department of Health in 1996 but have generally not been implemented by health professionals in local primary care. A strategy for the adoption and implementation of the Guidelines was developed in collaboration with health professionals in primary care.

Objectives. The development of a structured record, with prompts for the management of diabetes and hypertension according to the Guidelines.

Setting. Three community health centres (CHCs) in the Western Cape.

Participants. Doctors and nurses managing patients with diabetes and hypertension.

Methods. A draft of the structured record was developed at a single-pilot CHC in the Western Cape. Focus group discussions established the core requirements for a structured record. Process, result and structural indicators in line with the national Guidelines were considered for inclusion in the draft record. This draft record was then piloted at two other CHCs. Comments from semi-structured interviews and pre-

and post-test evaluation questionnaires were used to compile the final instrument.

Results. Eleven doctors and 8 nurses participated in the development of the final instrument. Important considerations in the design were a single-page, user-friendly format, tick-boxes to reduce writing, prompts, provision for sequential recording, target setting, and compatibility with the Guidelines. The final instrument was piloted and elicited a favourable overall response.

Conclusion. The structured record simplifies the application of the Guidelines and the systematic recording of processes of care. The effectiveness of the Guidelines will be evaluated further in a randomised control trial using the structured record.

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Guidelines based on consensus were issued by the South African National Department of Health in 1996 for the management of diabetes¹ and hypertension² and were disseminated to primary health care clinics without an explicit implementation strategy. A systematic review of the effect of education on physician performance suggests that passive dissemination of guidelines is not sufficient to change the behaviour of health care providers.³ The lack of influence on physician behaviour of low-intensity interventions such as passively disseminated guidelines was demonstrated by the failure of guidelines to modify the management of acute chest pain syndromes.⁴

In an audit conducted in the Western Cape, it was found that health professionals were not using the national guidelines (Daniels AR, Biesma R, Otten J, *et al.* — unpublished data) and that they were ambivalent and sceptical about guidelines improving clinical outcomes.⁵ Such attitudinal barriers may contribute to the poor quality of diabetes care previously demonstrated in the same health service⁶ and may impact adversely on the application of national guidelines. Doctors and nurses at one such clinic suggested that the incorporation of guidelines within a structured record, with prompts, would encourage use and adherence to the guidelines and could improve the recording of the processes of care.⁶

The aims of this study were to collaborate with health care professionals in order to promote the national Guidelines for diabetes and hypertension by means of the development of a structured record, and to evaluate the responses to this instrument in a sample of health professionals in primary care.

SUBJECTS AND METHODS

The methodology has been described elsewhere (Daniels AR, Biesma R, Otten J, *et al.* — unpublished data). Briefly, attitudes

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to the Guidelines were examined at four Western Cape community health centres (CHCs). At a single pilot clinic, seven doctors, four nurses and the nutritionist participated in four focus-group discussions that examined attitudes to the Guidelines. These discussions produced consensus on an implementation plan to encourage use of the Guidelines, namely the inclusion of the Guidelines within a structured record, with prompts. The core process and result indicators in the structured record were derived from recommendations contained within the national Guidelines. The algorithms were adapted from the national Guidelines and permitted clinical discretion. The draft record was tested by health professionals and was modified according to their suggestions, which were obtained from pre- and post-test evaluation questionnaires and semi-structured interviews. The comments relating to format, content, clarity and user-friendliness were used to modify the draft instrument.

The improved draft record was piloted at two independent CHCs that had not participated in the development of the record. The introduction of the record was preceded by an education package that consisted of the rationale for the development of the Guidelines and instructions for the use of the structured record. The instrument was tested in a sample of patients for 1 week at each site. The participating doctors completed pre- and post-test evaluation questionnaires. Comments from the latter were used for the development of separate instruments for diabetes, hypertension and their combination.

In order to remind health professionals to complete the record, the form was inserted into the clinic record by the admission clerk or the nurse at the clinic room. Forms were kept in the consulting rooms, and completed forms were filed with clinic notes.

The Community Health Services Organisation gave approval for the study to be performed in their clinics.

RESULTS

Requirements for Guideline usage

Health professionals had clear ideas regarding the format and content of the structured record. The preferred design features were simplicity of use, a single sheet, tick boxes to reduce recording time and clarity to allow easy visualisation of previous consultations. The form was designed to record routine visits and procedures over a period of 1 year. Non-routine visits for other medical conditions were recorded in the usual notes to avoid cluttering the structured record. Most participants wanted as much space as possible for the recording of comments. The preferred format followed the existing recording sequence of history, physical examination, complications, investigations, medications and

HYPERTENSION RECORD		Name :	Folder no :				
Year :		Date of diagnosis :					
LAST VISIT	Angina	Myocardial infarct	Heart failure	Stroke	TIA		
	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>		
	PVD	Diabetes mellitus	Hyperlipidaemia	Renal impairment	Other		
	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>		
EVERY VISIT	Family history of HT or heart disease		Smoking	Alcohol			
	Yes <input type="checkbox"/> No <input type="checkbox"/>		Yes <input type="checkbox"/> No <input type="checkbox"/> Past <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/> Past <input type="checkbox"/>			
	Total no of visits	Defaulter	Referral to dietitian	Referral to HT clinic at 2/2 nd hosp	Other		
	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>		
ANNUAL REVIEW	Visit No	1	2	3	4	5	6
	Doctor						
	Date						
	Weight (kg)						
	IMD:	(Yes/No)					
	Target organ damage	Heart failure: (Yes/No)					
		If yes, dysnoea ¹ NYHA Grade 1-4					
		TIA/Stroke: (Yes/No)					
	Side effects	Postural hypotension: (Yes/No)					
		Other:					
IF REFERRING GPH ECG	Medication compliance:	(Yes/No)					
	Height:	Ophthalmology findings	Urine (investigate if persistent)	Glucose*	Protein*	Blood*	
	BMI:						
	Waist:	Cardiomegaly - apex beat	Biochemistry	Creatinine	Potassium	Cholesterol	
	Hip:						
	Date	Normal	AF	LVH	Ischaemic	Past MI	Other
	Date	Normal	Cardiomegaly	LVF		Other	
	Date						
	Date						

NON-DRUG MANAGEMENT OF HYPERTENSION (Please tick if you have educated the patient about these topics)			
Lifestyle modification	Date	Teach the patient to:	Date
Reduce salt and alcohol intake	<input type="checkbox"/>	know their BP level	<input type="checkbox"/>
Control weight	<input type="checkbox"/>	request a BP reading at each visit	<input type="checkbox"/>
Follow a prudent diet	<input type="checkbox"/>	know the names and dosages of drugs	<input type="checkbox"/>
Do regular aerobic exercise	<input type="checkbox"/>	return drug containers at each visit	<input type="checkbox"/>
Stop smoking	<input type="checkbox"/>	take HT tablets before visiting clinic	<input type="checkbox"/>
		that HT is a risk factor, not a disease	<input type="checkbox"/>
		the consequences of a high BP	<input type="checkbox"/>

¹ THE NEW YORK HEART ASSOCIATION (NYHA) functional and therapeutic classification applied to dyspnoea
 Grade 1 - No breathlessness
 Grade 2 - Breathlessness on severe exertion e.g. climbing stairs, walking fast
 Grade 3 - Breathlessness on mild exertion e.g. during everyday activity
 Grade 4 - Breathlessness at rest e.g. while sitting

BLOOD PRESSURE MEASUREMENT						
Objectives	Target BP: mmHg				Mid-upper-arm circumference: cm	
Visit no	1	2	3	4	5	6
> 200						C
200						B
170						A
140						D
130						C
115						B
100						A
90						
< 90						

SA GUIDELINES: BLOOD PRESSURE MANAGEMENT				
<p>140/90 mmHg or more</p> <p>Anginal post myocardial infarction</p> <p>Target organ damage</p> <p>Diabetes mellitus</p> <p>Pregnancy</p> <p>Young hypertensives 18-30 years old</p> <p>REFER or INVESTIGATE</p>	<p>140/90 to 159/95 mmHg</p> <p>Review BP every 6 months</p> <p>1 BP period + 1 major risk factor</p> <p>Start drugs</p> <p>Step 1 drug</p> <p>hydrochlorothiazide HCTZ 12.5-25 mg daily</p> <p>Review after 3 months</p> <p>Step 2 drugs</p> <p>Add 1 of the following:</p> <ul style="list-style-type: none"> reserpine 1:1 adrenergic blocking agent ACE inhibitor calcium channel blocker (CCB) <p>Review treatment after 3 months</p> <p>Step 3 drugs</p> <ul style="list-style-type: none"> After reserpine or 1:1 blocker, add a vasodilator (e.g. hydralazine) or CCB or ACE inhibitor After CCB and ACE inhibitor, add a third agent from the list of step 2 drugs Alpha-adrenergic blocking agent <p>Review treatment after 3 months</p> <p>Uncontrolled hypertension</p> <p>REFER</p>	<p>170/100 to 189/114 mmHg</p> <p>Review BP after 2 weeks</p> <p>1 BP period</p> <p>If 1 BP period</p> <p>Start drugs</p> <p>Start both HCTZ and a step 2 drug</p> <p>REFER and full investigation within 1 week</p> <p>URGENT</p> <p>Refer and hospitalise on same day</p>	<p>200/115 mmHg or more</p> <p>Review BP after 1 hour</p> <p>1 BP period</p> <p>If 1 BP period</p> <p>Start drugs</p> <p>REFER and full investigation within 1 week</p>	<p>DSP 130 mmHg or more</p> <p>Suspect malignant hypertension with target organ damage and symptoms</p> <p>Immediately start nifedipine 5 mg orally and repeat every 6 hours</p> <p>URGENT</p> <p>Refer and hospitalise on same day</p>

TARGET BLOOD PRESSURE			ONGOING MANAGEMENT		
140/90 to 159/95 mmHg, with minimal, if any, side-effects	in the elderly, or in severe hypertension, lower the BP gradually	Need a strict target of <140/90 mmHg, irrespective of initial BP if end-organ damage, coexisting risk factors or diabetes	Once a stable target BP is achieved, follow-up 3-6 monthly	If there is postural hypertension, reduce the drug dosage	Improve compliance through a single daily dose regimen
			Monitor for side-effects regularly	If the target BP is stable for > 1 year, consider step-down therapy	
Visit no	DATE	CURRENT MEDICATION	CHANGES MADE/REMINDERS FOR NEXT VISIT		
1					
2					
3					
4					
5					
6					

Fig. 1. Above and below: structured record for hypertension.



DIABETES RECORD	Name :		Date of diagnosis :		Height :cm	
	Folder No :		Current year :		Waist :cm	
	Family history DM1 Yes <input type="checkbox"/> No <input type="checkbox"/>		IDDM Yes <input type="checkbox"/> No <input type="checkbox"/>		NIDDM Yes <input type="checkbox"/> No <input type="checkbox"/>	
	Insulin therapy Yes <input type="checkbox"/> No <input type="checkbox"/>		Other			
	Angina Yes <input type="checkbox"/> No <input type="checkbox"/>		Myocardial infarct Yes <input type="checkbox"/> No <input type="checkbox"/>		Heart failure Yes <input type="checkbox"/> No <input type="checkbox"/>	
	Stroke Yes <input type="checkbox"/> No <input type="checkbox"/>		TIA Yes <input type="checkbox"/> No <input type="checkbox"/>			
	Hypertension Yes <input type="checkbox"/> No <input type="checkbox"/>		Hyperlipidaemia Yes <input type="checkbox"/> No <input type="checkbox"/>		Renal impairment Yes <input type="checkbox"/> No <input type="checkbox"/>	
	Alcohol Yes <input type="checkbox"/> No <input type="checkbox"/>		Smoking Yes <input type="checkbox"/> No <input type="checkbox"/>			
	PVD Yes <input type="checkbox"/> No <input type="checkbox"/>		Periph. neuropathy Yes <input type="checkbox"/> No <input type="checkbox"/>		Amputation Yes <input type="checkbox"/> No <input type="checkbox"/>	
	Cataract Yes <input type="checkbox"/> No <input type="checkbox"/>		Eyes Yes <input type="checkbox"/> No <input type="checkbox"/>		Retinopathy Yes <input type="checkbox"/> No <input type="checkbox"/>	
Glaucoma Yes <input type="checkbox"/> No <input type="checkbox"/>						
Total no of visits		Referral to dietician Yes <input type="checkbox"/> No <input type="checkbox"/>		Referral to chiropodist Yes <input type="checkbox"/> No <input type="checkbox"/>		
		Referral to ophthalmologist Yes <input type="checkbox"/> No <input type="checkbox"/>		Referral to DM clinic at 2 nd /3 rd hosp Yes <input type="checkbox"/> No <input type="checkbox"/>		
Visit No: 1		2		3		
2		3		4		
3		4		5		
4		5		6		
Doctor:						
Date:						
Weight						
Blood glucose ^a		Fasting		Random		
Blood pressure ^b						
Hypoglycaemia Y/N						
Hyperglycaemia Y/N						
Other ^c Y/N						
Medication compliance Y/N						
Date:		1 st examination:		2 nd examination:		
Side:		Left		Right		
Callous Y/N						
Ulcers ^d Y/N						
Infection ^e Y/N						
Gangrene ^f Y/N						
Amputation Y/N						
Sensation ^g Normal/Abnormal						
Pulses ^h Normal/Reduced/Absent						
Ankle reflex ⁱ Present/Absent						
Date:		Glucose		Ketones		
1 st :				Blood		
2 nd :				Leucocytes		
Date:		Visual acuity ^j		Cataract ^k		
Left				Background ^l		
Right				Retinopathy Proliferative ^m		
				Maculopathy ⁿ		
Blood results		HbA1c		Total cholesterol ^o		
Creatinine ^p				Triglycerides ^q		

^a Site dependent - interval for changes in therapy - 3 monthly, if targets not achieved
^b BP > 140/90 - Refer to hypertension guidelines
^c If ulcers or infection - treatment and review or referral
^d If ischaemic foot or gangrene - urgent referral
^e If abnormal, instruction in self foot care
^f Declining visual acuity or cataract - referral to ophthalmologist
^g Acute visual deterioration, proliferation or maculopathy - urgent referral to ophthalmologist
^h Cholesterol > 6.5 mmol/l - dietary advice
ⁱ Creatinine > 0.15 mmol/l - referral to renal clinic
^j Triglycerides > 3.0 mmol/l - dietary advice

recommendations, and permitted sequential data entry at intervals specified within the Guidelines. An A4 format for the instrument was preferred because it fitted into the existing notes and could be photocopied.

Content of the structured record

Several process indicators that could influence optimal management were included. These were the detection of risk factors, screening for complications, the establishment of treatment goals, therapy defined by the Guidelines and participation in education to encourage modification of risk factors. Result indicators were blood glucose, blood pressure, body mass index, urinalysis, electrocardiogram, chest radiograph, glycosylated haemoglobin, serum creatinine and lipids. Structural factors related to the organisation of care were not addressed, but the instrument was designed for the inclusion of comments by nurses and dieticians and for data entry at guideline-driven intervals (Figs 1 and 2).

Testing of the structural record

Comments about the structured record were generally favourable, with minor reservations on the part of some of the health professionals. They stated that the structured record promotes a holistic approach to the care of patients with diabetes and hypertension, and that the form permits the assessment of clinical status at a glance and promotes continuity of care. They felt that all members of the health team would be able to see what has been done and that discussion about management would be promoted. Several comments were made to the effect that other chronic diseases need a similar record and that a copy should be used as a patient-carried record.

Overall, the record was thought to save time, although initially more time was required for the recording of the baseline information. Most of the health professionals considered the record to be an excellent vehicle for getting maximum information during the consultation, and for clinic staff rapidly becoming familiar with the content and Guidelines. The form satisfied most of the requirements for optimal record keeping and was felt to be a reasonable compromise between the supply of clinical information and the consolidation of quality, standardised work practices.

Some differences of opinion were expressed that influenced the evolution of the final version. These differences included the first impression that the record is intimidating, since it is complicated and detailed and does not allocate enough space for comments. It was felt that initially the form, including reference to the Guidelines, takes some time to complete and may inconvenience patients. However, it was noted that as more forms were completed less time was required. The presence of prompts was thought to be prescriptive and unnecessary. The inability to modify the record for multiple

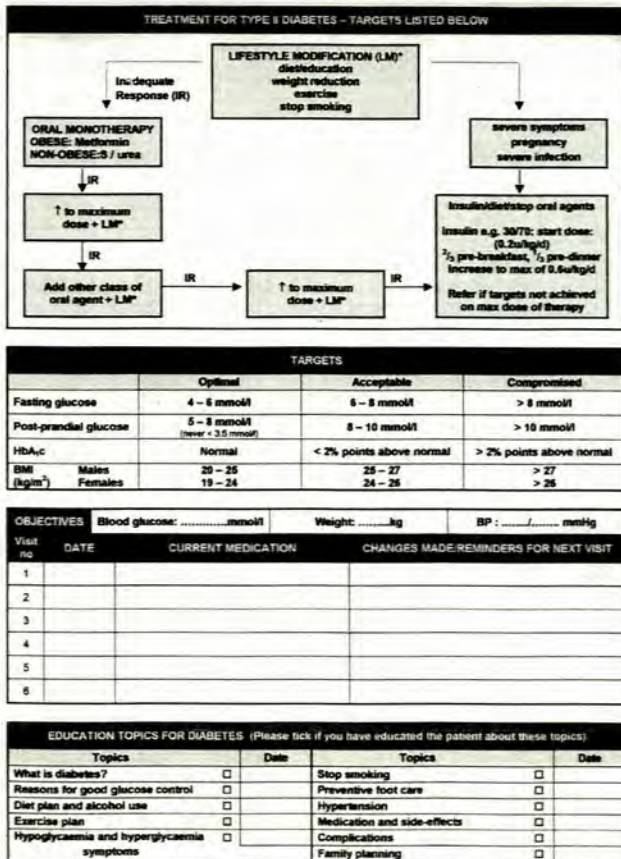


Fig. 2. Above and below: structured record for diabetes.



problems, e.g. hypertension and heart failure, was seen to be a drawback, as duplicate recordings are required for the usual folder. The Guidelines were thought to interfere with clinical autonomy; for example it was held that the decision to change pharmacological management should be at the discretion of the clinician only. Some doctors mentioned the potential advantages of a computerised version of the record.

DISCUSSION

The results of this study show that health professionals are motivated to participate in a process of guideline development for the purposes of developing tools that could improve the quality of care for hypertension and diabetes⁷⁻⁹ (and Steyn K, Levitt N, Fourie J, *et al.* — unpublished data). This positive attitude to participation contrasts with the earlier ambivalence noted towards the introduction of the Guidelines and our previous finding that health professionals had not adopted the Guidelines for routine clinic use. We attribute the co-operation to the opportunity to participate in the development process of an instrument that is relevant to their needs.¹⁰ They anticipate that the instrument will have two positive effects on clinic organisation, namely the opportunity to overcome the problem of inadequate recording of data for chronic diseases, and the enhancement of teamwork. Similar results were obtained when the use of guidelines for diabetes care was examined.⁸

Inadequate recording of basic clinical details is a recognised barrier to optimal care of diabetes and hypertension and may contribute significantly to the poor quality of care that has been recognised in local settings. Participants who use the structured record become familiar with the content of the Guidelines and are soon able to apply them from memory. In many instances the Guidelines are congruent with the existing practice of individual doctors. This provides indirect positive feedback and reinforces the value of their participation. The algorithms incorporated within the structured record should be read in conjunction with the formal Guidelines and permit the application of clinical expertise in situations where the algorithms are not explanatory. For example, the algorithm does not specify the intervals when lifestyle modification is judged to be ineffective, and effective tablet therapy is required to achieve acceptable blood glucose targets.

A potential benefit of the structured record is as a tool for audit and evaluation of quality of care. It also provides more opportunities for discussion about patient care, thereby improving education and enhancing teamwork by serving as a basis for the systematic devolution of more responsibility to nurses in the delivery of chronic care.

The suggestion that the instrument be used as a patient-carried record should be investigated further. This may lead to improved compliance associated with the implied recognition of a partnership for health care delivery. A reduction in waiting times for folders on arrival at the clinic is another likely positive outcome.

Although the structured record was developed in association with primary health professionals, over-optimism about the generalisability of the record to other health services would be misplaced, as unknown biases may influence the degree of acceptance of the form in different settings.

Such records could be computer- or paper-based. A paper record that can be photocopied has been developed, but this can be modified easily when computers become available. (Daniels AR, White M — unpublished data). A computerised record would further improve the recording of the processes of care and would improve adherence to the Guidelines.

Health administrators may instinctively believe that guidelines improve care, but significant attitudinal barriers have to be addressed before guidelines can be applied. This implementation strategy seems to be successful, as measured by the responses of the health professionals who participated in the development of the structured record. The principles of this strategy can be used to help with the implementation of guidelines and other health care innovations in other local settings. Other attempts have been made within South Africa to help health care providers improve the quality of health care delivery. An example is the quality assessment instrument for routine use by district clinic supervisors in primary health care clinics involved in the management of sexually transmitted diseases.¹¹ The development of the instrument followed a similar process of consultation, participation, audit and feedback.

Finally, we intend to examine the effectiveness of these Guidelines and the structured record on diabetes and hypertension management in a randomised control trial in primary care clinics.

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