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The 45 year old health check

Feasibility and impact on practices and patient behaviour

Background

The 45 year old health check (MBS item 717) for patients aged 45–49 years was introduced in 2006. This study evaluated its impact on preventive care and patient reported risk factors.

Methods

A quantitative and qualitative study was conducted in eight general practices in Sydney, New South Wales. It involved follow up surveys of 118 patients taken both before the check and 3 months after. Practice staff were trained and supported to conduct the health checks and appropriate interventions.

Results

There was ambivalence among some of the general practitioners toward the health check, but most found it feasible. The reported frequency of GP advice relating to each of the SNAP (smoking, nutrition, alcohol, and physical activity) risk factors increased; patient referrals, however, were infrequent. Patients' readiness to change their diet and exercise habits improved as a result of the check, with respondents showing an increase in both the consumption of vegetables and the frequency of physical activity. There was no change in body mass index, smoking or alcohol consumption.

Discussion

The health check was associated with a short term improvement in diet and physical activity behaviours. Mechanisms to enhance referral need to be developed.

■ **In 2004–2005, 90% of Australian adults had at least one, and 44% had at least three, of the following modifiable chronic disease risk factors (of): tobacco smoking, physical inactivity, low fruit or vegetable consumption, at risk alcohol intake, hypertension, high blood cholesterol or excess weight.¹ While there is evidence supporting the feasibility of addressing these risk factors in general practice, due to lack of both specific funding and time required to support assessment and counselling, interventions of this nature are infrequent.²**

Planned health assessments in middle aged adults improve the detection of behavioural risk factors such as smoking, poor nutrition, at risk alcohol consumption and physical inactivity (SNAP).^{3,4} However, while there is evidence that these assessments help reduce behavioural and physiological risk factors, especially in high risk and disadvantaged groups,^{5,6} there is conflicting evidence concerning their effectiveness in preventing chronic disease.^{7–9}

Following the Council of Australian Governments' (COAG) Better Health for all Australians Action Plan,¹⁰ a 'well person's health check' in general practice for people aged 45–49 years (MBS item 717) was introduced in November 2006 as a once only service for those who have one or more identifiable risk factors for chronic disease. While there has been rapid uptake of this item, there remains little available evidence relative to how it should be implemented or its effectiveness in modifying risk factors.¹¹

In 2007, the authors conducted a study to evaluate the impact of the health check on preventive care outcomes and patient reported risk factors.

Methods

This study was conducted in general practices in the Central Sydney and South Eastern Sydney divisions of general practice. Of the practices that were invited to participate, 29 responded. From these, eight were selected based on eligibility – the practices chosen needed to be using computer based medical records and not be involved in co-existing research – and the need for a range of practice sizes (three

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solo practices, three two doctor practices and two larger 5–6 doctor practices). Each practice identified up to 80 patients aged 45–49 years of age who had attended the practice in the previous year. The general practitioners were asked to remove patients from the list who had died, or who had:

- current severe illness or overriding personal circumstances
- diabetes or cardiovascular disease
- significant cognitive impairment
- left the practice
- already had a 45 year old health check.

Data collection

Data was collected from the practices via two means: a clinician preventive care survey and semistructured clinician interviews.

In the clinician preventive care survey, each GP and practice nurse completed a survey to assess their preventive care at baseline, and then again at 3 months. This survey included selected items from the SNAP interventions survey¹² and the Preventive Medicine Attitudes and Activities Questionnaire (PMAAQ).¹³

In the semistructured clinician interviews, participating GPs and the practice nurse were interviewed before and after the intervention. They were asked about their experience with the health checks and the facilitators, as well as any barriers they experienced to its implementation and to patient behaviour change.

For patient data collection, patients completed a mailed questionnaire both before and 3 months after their recall to the practice for a health check. Patients were mailed one reminder. The survey asked patients questions about the 3 months leading up to their health check, including:

- reported assessment and management of SNAP risk factors
- attendances at other services
- self reported fruit and vegetable, smoking, and alcohol intake, as well as level of physical activity, based on validated questions from other surveys^{14–16}
- stage of readiness to change,¹⁷ and attempts to decrease SNAP risk factors.

Intervention

A division based facilitator supported the implementation of the health checks by establishing systems and structures for patient recall and providing patient education materials such as the 'Lifestyle prescription' resources and guidelines.¹⁸ In addition, clinicians attended a workshop to learn skills in motivational interviewing and the assessment and management of behavioural risk factors. At

each health check, in accordance with the '5As' approach,¹⁹ GPs and practice nurses were asked to:

- 'ask' about and 'assess' the patient's behavioural and other risk factors
- provide 'advice' and information
- offer brief interventions, including written material and motivational interviewing ('assist')
- 'arrange' referral and follow up where appropriate.

Analysis

Clinician surveys and interviews were coded based on recurrent themes, with emergent themes added to the coding framework to ensure completeness. Codes were reviewed for duplication and clarity and edited accordingly, before being cross checked by a second researcher. Qualitative analysis was done using the software program NVivo.

For the patient surveys, the data from all respondents who completed both surveys were included, even if they had not completed their health check. Multilevel analysis (MLwiN Software²⁰) tested for clustering of patients (level 1) within practices (level 2) regarding patient reported advice and referral and in the behavioural risk factors and readiness to change data. After no significant cluster effects ($p > 0.8$) were found, single level analysis was used to analyse the data.

Nonparametric statistical tests were performed on categorical data, with the Wilcoxon signed rank test used for pre- and post-measures on the same individuals. For the normally distributed continuous data – changes in patient reported body mass index (BMI), frequency of physical activity and portions of fruit and vegetables consumed each day – paired t-tests were used to analyse change. Quantitative data analysis was conducted with SPSS statistical software.

The study received approval from the University of New South Wales Human Research Ethics Committee. All participants gave fully informed written consent.

Results

Thirteen GPs (seven women and six men) and one practice nurse participated in the study. Together, the participants had a mean of 18 years working experience.

In total, 547 patients were invited to participate, to which 150 (27.4%) responded to the first survey and reminder. Thirty-two patients were lost to postintervention follow up, leaving 118 patients in the study (21.6% of those invited). This sample proved to have a higher proportion of married and employed people than those in the region of comparable age (*Table 1*). Just over half of the participating patients had attended the practice for more than 6 years.

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At baseline, 97.5% of participating patients had at least one SNAP risk factor, with the majority having two or more. Of the study participants, 17.1% were smokers, 83.6% had insufficient fruit and vegetable intake, 50.9% were overweight or obese, 53.4% had at risk alcohol consumption, and 57.3% had insufficient physical activity.

Participants were included using the intention to treat principle. According to practice billing records, 77% of the participating patients had been billed for MBS item 717.

Implementing the health checks

The number of consultations GPs undertook to complete the health check varied between 1–3 visits, with all but one GP needing more than a single visit. (The multiple visits were primarily to allow the GP and patient to review blood test results.) The majority of GPs agreed that a health check required assessing risk factors, ordering blood tests, reviewing results, and providing educational interventions as necessary. They also agreed that time was a major constraint on their ability to complete the health check:

‘When you went to the workshop you thought, ‘Oh, I’m going to do all this, I’m going to check all these patients,’ but when it comes to doing it, it’s a different story...because of time...’ (GP in two GP practice)

All participants, however, were able to implement the health check. Some found the opportunity to assess and manage risk factors in the health check particularly useful:

‘Being able to address the issues separately as a separate consultation I think is very worthwhile... you can get far more into the issues than you can when you see someone who’s in the right age group and they’ve come in for something else’. (GP in five GP practice)

Management of behavioural risk factors

General practitioners’ attitudes to preventive care varied, and these attitudes and beliefs appeared to strongly influence their approach to managing the behavioural risk factors. Most expressed a belief that preventive care was part of their role and responsibility. Some, however, did not feel that it was a high priority:

‘[Prevention is] important but it’s not like we’re dealing with an ongoing health complaint [like]... cancer or a heart disease where if they didn’t do something and they didn’t turn up for their next appointment that things are likely to go wrong because this is of an ongoing impact’. (Solo GP)

These GPs did not feel that the MBS item 717 added much to their capacity to provide preventive care. They said there was little financial incentive over and above the remuneration for a long consultation, and that they preferred to provide preventive care opportunistically over many consultations. For other GPs, the health check made proactive preventive care a more viable option:

‘It allows us to take the time to consider all the factors. It is a really time consuming task and without the remuneration it’s just not viable’. (GP in five GP practice)

Reported management of lifestyle risk factor behaviour focused primarily on advice giving. There was an increase in the information and advice that patients reported receiving with regard to each of the risk factors after the intervention (smoking $p=0.05$, nutrition $p<0.001$, alcohol $p<0.001$, physical activity $p<0.001$) (Table 2).

Some GPs reported that the patients who came for the health check tended to be more motivated:

‘By and large they were the ones that already knew they should be doing these things... so the impression I got was that those that needed it most... are the ones that aren’t going to come anywhere near us’. (GP in five GP practice)

Most GPs reported that assessment of a patient’s readiness to change was a useful component of the health check because it allowed them to prioritise patients for lifestyle interventions:

‘Now you can address some of the risk factors and assess somebody’s willingness to make changes in their lifestyle and with the particular point they’re up to so you know whether or not you’re wasting your time...’ (GP in two GP practice)

Many GPs found intervening in lifestyle risk factors to be challenging, particularly when it went beyond providing advice and involved motivating the patient:

‘I always try but it is [like] the example of the horse: you can drag the horse to the water but you can’t make the horse drink’. (Solo GP)

Table 1. Characteristics of participants

	2005 Central Sydney Statistical Division census for people aged 45–49 years ²³	Health check study data (n=118)
Male	51.3%	43.6%
Overseas born	35.7%	47.0%
Married	35.0%	71.2%
Employed full or part time	35.0%	80.7%
Home owner or purchaser	64.2%	65.8%
Educational attainment year 12 or HSC or higher	55.4%	63.3%

Table 2. Information/advice given to, or referral of, patients with risk factors

Risk factor	Number with risk factor	Information and advice given		Referral	
		Before n (%)	After n (%)	Before n (%)	After n (%)
Smoking	20	3 (15)	18 (90)*	2 (10)	5 (25)
Nutrition	93	28 (30)	72 (77)**	1 (1)	8 (9)*
Alcohol	62	5 (8)	47 (76)**	0	1 (1)
Physical activity	67	16 (24)	55 (82)**	2 (3)	9 (13)*

* $p < 0.05$ ** $p < 0.001$

Referral was infrequently utilised (less than one in 5 of those at risk), although it did increase post intervention (Table 2). While some GPs cited cost and availability as reasons for not offering referral, others felt it was unnecessary, and should only be given if there were complicating factors and/or chronic disease and the patients were already motivated:

'If I'm going to refer them and if they are not quite motivated... then it's going to fail and they would have spent money as well and then they would be turned off next time to even talk to the doctor because they will be referred'. (Solo GP)

Some GPs preferred to offer in house education or information largely because they did not feel that the referral services were useful. Those GPs that did use private referrals, while mentioning that cost could be a factor, spoke of the benefit of having a multidisciplinary approach:

'[Private referrals]... at least get people motivated and [show them that] this is a multifaceted approach to solving a problem... Cost is always an issue, but again it depends on where your practice is'. (GP in five GP practice)

Change in patient risk behaviour

In their responses, GPs said they felt that they were more effective at changing diet than the other risk behaviours. The health check offered an opportunity to deal with risk behaviour in a context where patients expected it:

'In a normal consult, I don't raise all of these risk factor issues with them, so I can't really compare, but during the health checks they were quite acceptable'. (GP in five GP practice)

Almost half (44.1%) of participating patients reported making a lifestyle change as a result of the health check. Patients reported increasing their consumption of vegetables and the frequency of vigorous or moderate physical activity. There were no significant changes in the number of portions of fruit consumed, however, nor in patients' BMI, or in the proportion that smoked or consumed at risk levels of alcohol (Table 3). While more patients were either contemplating changing or acting to change their level of physical activity and fruit and vegetable intake after the health check, the proportion of patients with at risk levels of behaviour did not change significantly.

Discussion

Of the patients invited to attend the health check, one-fifth responded. These patients were more motivated than regular patients.

Some GPs were sceptical about the value of the health check; on the whole, however, most found it feasible. While GPs found the assessment (including assessment of readiness to change) easy to implement, management – in particular motivating patients to change their behaviour – proved more difficult.

Referrals for nutrition and physical activity interventions increased as a result of the health checks. Few patients, however, were referred to other providers: instead, GPs preferred to provide in house education either themselves or using other practice staff, which is consistent with previous studies.²¹

This study demonstrated an improvement in preventive care for patients in the target age group. Patients attending the health check were more likely to be offered information and advice about their lifestyle risk behaviours than in the previous 3 months before the health check. But while there was an improvement in self reported physical activity and diet behaviours at 3 months, few patients had changed their overall level of risk, which is again consistent with other studies.⁴⁻⁹

While the intensity of this clinical intervention may be sufficient to help patients make some changes to their lifestyle and intentions, such intervention might not be enough to bring about major changes in patient chronic disease risk. Interventions that have been proven to bring about these changes have involved referral to providers or programs outside the practice.⁵⁻⁷

This study demonstrated that divisions of general practice, along with an appropriately trained facilitator, can provide sufficient practice support visits, provider training and resources to help practices conduct health checks. In order to enhance GPs' effectiveness in helping patients change behavioural risk factors, however, more intensive and sustained interventions may be required with at risk patients. To address this issue, in July 2008, another MBS item was funded to assist GPs in assessing patients aged 40–49 years for diabetes risk and refer these patients for diet and physical activity support.²² While this helps address the lack of referral options for GPs following a health check, disappointingly, it remains limited to patients aged 40–49 at risk of diabetes.

Limitations of this study

This study has a number of limitations: it was conducted in only eight Sydney practices in 2007, shortly after the introduction of the Medicare item; there was no control group and patients were only followed up for 3 months. It does however, provide an early indication of the feasibility,

Table 3. Lifestyle behaviours 3 months before and after the health check (n=118)

	Before	After	Change pre-post
Patient lifestyle risk factors			
Portions of fruit consumed per day	2.3	1.9	NSC in portions
Portions of vegetables consumed per day	2.25	2.65	NSC in portions
BMI	26.1	26.1	t=3.8, p<0.001
Frequency of moderate and vigorous physical activity (out of 8)*	3.12	3.56	t=2.4, p<0.05
Smoking	20 (17.0%)	24 (20.3%)	NSC
At risk alcohol consumption	62 (52.5%)	59 (50.0%)	NSC
Patient readiness to change lifestyle behaviours (ready, action or maintenance)			Difference in stage of change pre-post
Increase fruit and vegetable consumption	76 (64.4%)	85 (72.0%)	z=-2.306, p=.001
Increase physical activity	74 (62.7%)	87 (73.7%)	z=-3.196, p<0.05
Quit smoking	7 (5.9%)	8 (6.8%)	NSC
Reduce alcohol consumption	46 (39.0%)	44 (37.3%)	NSC
* Scoring of frequency of physical activity per week ²³ : Vigorous for 20 minutes: none = 0, 1-2 = 2, 3+ = 4; moderate for 20 minutes: none = 0, 1-2 = 1, 3-4 = 3, 5+ = 4			
NSC = no significant change			

acceptability and impact of this new MBS item. Further research is required to evaluate the longer term impact of the health check – especially if it is supplemented with other support and education programs by practice nurses, and other health providers and services outside general practice.

Implications for general practice

This study suggests that health checks in middle age can help GPs to increase the detection and management of risk factors, and overcome some of the limitations of opportunistic preventive activities in consultations for other purposes. To sustain changes in patient behaviour and prevent chronic disease however, a more integrated approach involving other practitioners both within and outside the practice may be needed.

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References

1. Australian Institute of Health and Welfare (AIHW). Chronic diseases and associated risk factors in Australia, 2006. Canberra: AIHW, 2007.
2. Steven ID, Thomas SA, Eckerman E, et al. The provision of preventive care by general practitioners measured by patient completed questionnaires. *J Qual Clin Pract* 1999;19:195–201.
3. Bouleware LE, Barnes GJ, Wilson RF, et al. Systematic Review: The Value of the Periodic Health Evaluation. *Ann Intern Med* 2007;146:289–300.
4. Dowell AC, Ochera JJ, Hilton SR, et al. Prevention in practice: results of 2-year follow-up of routine health promotion interventions in general practice. *Fam Pract* 1996;13:357–62.
5. Ebrahim S, Beswick A, Burke M, Davey Smith G. Multiple risk factor interventions for primary prevention of coronary heart disease. *Cochrane Data of Syst Rev* 2006; Issue 4. CD001561.
6. Wood DA, Kotseva K, Connolly S, et al. Nurse-coordinated multidisciplinary, family-based cardiovascular disease prevention programme (EUROACTION) for patients with coronary heart disease and asymptomatic individuals at high risk of cardiovascular disease: a paired, cluster-randomised controlled trial. *Lancet* 2008;371:1999–2012.
7. Finkelstein EA, Khavjou O, Will JC. Cost-effectiveness of WISEWOMAN. A program aimed at reducing heart disease risk among low-income women. *J Womens Health* 2006;15:379–389.
8. Imperial Cancer Research Fund OXCHECK Study Group. Effectiveness of health checks conducted by nurses in primary care: final results of the OXCHECK study. *BMJ* 1995;310:1099–104.
9. Family Heart Study Group. Randomised controlled trial evaluating cardiovascular screening and intervention in general practice: principal results of British family heart study. *BMJ* 1994;308:313–20.
10. Council of Australian Governments February Meeting Communiqué. Attachment D – Better health for all Australians: Action plan. Available at www.coag.gov.au/meetings/100206/attachment_d_better_health.rfi [Accessed 1 October 2008].
11. Chan A, Amoroso C, Harris MF. New 45–49 year health checks – GP uptake of MBS item 717. *Aust Fam Physician* 2008;37:765–8.
12. Amoroso C, Hobbs C, Harris MF. General practice capacity for behavioural risk factor management: A snap-shot of a needs assessment in Australia. *Journal of Primary Health Australia* 2005;11:120–7.
13. Yeazel M, Lindstrom Bremer K, Center B. A validated tool for gaining insight into clinicians' preventive medicine behaviors and beliefs: The preventive medicine attitudes and activities questionnaire (PMAAQ). *Preventive Medicine* 2006;43:86–91.
14. Barr M, Baker D, Gorrine M, Fritsche L. NSW population health survey: Description of methods. Available at www.health.nsw.gov.au/resources/publichealth/surveys/health_survey_method.asp [Accessed 30 September 2008].
15. Bush K, Kivlahan D, McDonnell M, Fihn S, Bradley K. The AUDIT alcohol consumption questions (AUDIT-C). *Arch Internal Med* 1998;158:1789–95.
16. Smith B, Marshall A, Huang N. Screening for physical activity in family practice: evaluation of two brief assessment tools. *Am J Prev Med* 2005;29:256–64.
17. Vallis M, Ruggiero L, Green G, et al. Stages of change for health eating in diabetes: Relation to demographic, eating-related, health care utilization, and psychosocial factors. *Diabetes Care* 2003;26:1468–74.
18. Australian Government Department of Health and Ageing. Lifescripts. Available at www.health.gov.au/internet/main/publishing.nsf/Content/health-pubhlth-strateg-lifescrpts-index.htm [Accessed 1 October 2008].
19. The Tobacco Use and Dependence Clinical Practice Guideline Panel, Staff, and Consortium Representatives. A clinical practice guideline for treating tobacco use and dependence: A US Public Health Service report. *JAMA* 2000;283:3244–54.
20. Goldstein H, Rasbash J, Plewis I, et al. A user's guide to MLwiN. London: Institute of Education, 1998.
21. Harris MF, Hobbs C, Powell Davies G, Simpson S, Bernard D, Stubbs A. Implementation of a SNAP intervention in two divisions of general practice: a feasibility study. *Med J Aust* 2005;183:s54–s58.
22. Australian Government Department of Health and Ageing. Type 2 diabetes risk evaluation. Available at www.health.gov.au/internet/main/publishing.nsf/Content/Diabetes-Risk_Evaluation [Accessed 30 September 2008].
23. New South Wales Department of Health. Report of the Chief Health Officer 2006. Available at www.health.nsw.gov.au/pubs/2006/chorep_06.html [Accessed 24 February 2009].
24. Marshall AL, Smith JJ, Bauman AE, Kaur S. Reliability and validity of a brief physical activity assessment for use by family doctors. *Br J Sports Med* 2005;39:294–297.