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## Practice visitations in primary care to improve performance of cardiovascular risk management

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### Abstract

**Background** Despite programmatic protocolized care and structured support, considerable variation is observed in completeness of registration and achieving targets of cardiovascular risk management between individual general practitioners in the Netherlands.

**Aim** To determine whether completeness of registration and achieved targets of cardiovascular risk factors improves with practice visitation.

**Design and setting** Observational study utilizing the care groups' database (2016-2019) comparing changes in registration and achieved targets in non-visited practices and visited practices.

**Methods** We compared completeness scores of registration and scores of targets achieved before visitation and 1 year after visitation. Data were analyzed on patient level and on general practitioners level. Separate analyses were performed among general practitioners who were ranked in the lower 25% of score distributions.

**Results** We observed no clinically relevant improvements in completeness of registration and targets achieved in 2017, 2018 and 2019 that could be attributed to visitations in the previous year, both on individual patient level as on aggregated level per general practice.

In practices ranked in the lower 25% of the distribution, improvements over time were clinically relevant and larger than the overall changes. Yet, these findings were irrespective of the number of practice visitations.

**Conclusion** Practice visitations in our setting did not seem to lead to improvements in practice performance, nor in completeness of registration of risk factors or in reaching predefined target goals for cardiovascular risk factors.

Keywords: practice visitations, cardiovascular risk management, primary care, prevention

### **How this fits in**

Although comprehensive care group support was identical for all affiliated general practices from the start with integrated CVRM care in 2010, considerable variation in performance between practices regarding completeness of registration and reaching predefined targets was observed after a few years. To reduce inter practice variation the care group started with individual practice visitations in 2016 to support practices with the organization of integrated CVRM care. Low and moderate performing practices were visited 2 or 3 times a year, while average and good performing practices were not visited or were visited once a year. Completeness of registration and reaching targets did not seem to improve, regardless the number of visitations.

### **Introduction**

Since the introduction of national and international guidelines cardiovascular risk management (CVRM) is increasingly organized and implemented by primary care groups in the Netherlands (1,2). Primary care groups are responsible for the provision of a high-quality, evidence-based CVRM care programme for affiliated practices. The implementation of the CVRM care programme was delegated to a practice nurse (PN) supervised by the general practitioner (GP). The PN guided eligible patients with medication adjustments and supported with stop-smoking, changing unhealthy food habits and increasing exercise. The care group supported practices with protocols, small group interactive education, audit and feedback (A&F), outreach visits and reminders, as it is known that a comprehensive approach is most beneficial to improve implementation (3). A&F is a widely used component in clinical programmes, but its effect is shown to be modest (4-8). To what extent A&F is of value to programmatic CVRM is not yet known. Therefore, the aim of the present study was to investigate whether A&F delivered during practice visitations lead to improvements in completeness of registration

and reaching predefined targets among participating practices in the CVRM care programme between 2016 and 2019.

## **Methods**

### **Study design and study population**

We carried out a dynamic cohort study using data that were routinely collected from 128 practices affiliated to the PoZoB primary care group in 2016. The care group implemented a nurse-led integrated CVRM care programme between 2010 and 2013. The practices were located in and around Eindhoven, in the south-east of The Netherlands. They were a mixture of rural, semi-rural and urban practices and can be considered representative for the Dutch situation.

### **Data collection**

In 2016 data was collected from 48,258 patients eligible for integrated CVRM care. Conditions for eligibility for the CVRM care programme were based on the National CVRM guideline 2012 and have been described in detail elsewhere (9,10). Patient data was collected in the care groups' multidisciplinary registration (Care2U: C2U). For the present analyses we excluded practices that changed hands between 2016 and 2019, because starting GPs often have other priorities than organizing disease management programmes. We therefore used data from 128 practices (40,525 eligible patients) where the same GP was employed between 2016 and 2019.

### **Care group support and benchmark indicators**

Between 2010 and 2015 the care group supported with work protocols, peer group meetings for the PN and education for GPs and PNs on cardiovascular related topics. From 2016 onwards, the care group started publishing quarterly benchmark reports in which individual practices could compare their performance with overall care group performance. Indicators used for defining performance were i) registration of: systolic blood pressure (SBP), LDL-cholesterol, estimated glomerular filtration rate (eGFR), body mass index (BMI), range of exercise (based on the Dutch norm for healthy physical exercise), alcohol intake and smoking status and ii) outcomes: the proportion of patients on target for SBP ( $\leq 140$  mm Hg), LDL-cholesterol ( $\leq 2.5$  mmol/l), BMI ( $\leq 25$  kg/m<sup>2</sup>), the proportion of non-smokers, the proportion on blood pressure lowering treatment and the proportion on lipid modifying treatment. For every indicator the care group mean and standard deviation was calculated which was used as benchmark for individual practices. Mean plus 1 standard deviation was defined as "best practice" and mean minus 2 standard deviations as "minimal norm". Standards were discussed in staff meetings and confirmed in the care group Advisory Board of General Practitioners. With these standards set, every individual practice was given an impression about their performance with the overall care group as comparator.

### **Practice visitations**

In 2016 the care group started with practice visitations to discuss performance based on the benchmark data and offer support to improve the organization of CVRM. Important goals of the visitations were building a relationship of trust and emphasize the partnership between practice and care group. In case of low performance, the care group supported with the analysis of possible causes, made practices primarily responsible and co-owner of the solution and provided temporary guidance. Visitations were performed by a university trained staff member with an additional education in management and organization. Practices having difficulties with organizing and implementing the CVRM care programme (discontinuity of staff, insufficient hours for the PN, no regular consultations between GP and PN) and practices with a number of indicators below the minimal norm were initially prioritized for visitation. Practices could also request a visitation. The visitations usually lasted 1-1.5 hours and in almost all cases were carried out by one staff member. In exceptional cases the visit was carried out by 2 persons if a specific problem needed to be explained. Practice members attending the visits were the general practitioner (GP), the practice nurse (PN) and in some cases the manager of a health center. Based on a standard 8 item questionnaire shown in Box 1, practice organization and performance was discussed with the GP and the PN. An example of items discussed during a practice visitation is given in Supplementary Box 1.

### **Data analyses**

We started with the registration of SBP, LDL-cholesterol, eGFR, BMI, alcohol intake, (self-reported) range of exercise and smoking status in 2016 on an individual patient level. An item registered = 1, not registered = 0, adding up to an individual patient score between 0 and 7. This was followed by the same procedure for reaching the predefined targets: SBP  $\leq$  140 mm Hg, LDL-cholesterol  $\leq$  2.5 mmol/l, BMI  $\leq$  25 kg/m<sup>2</sup>, not smoking, use of blood pressure lowering medication and the use of lipid modifying medication, adding up to an individual patient score between 0 and 6. Next, the mean number of scored items per individual patient in practices with no visit (V0), with one visit (V1) and with more than one visit (V2/3) in 2016 were compared with the scores observed in those patients in 2017 (the next year). As the study was designed as a dynamic cohort study, patients may leave the study and new eligible patients may enter the study. We compared only those patients that were in the study for both time periods. A similar procedure was applied for the 2017-2018 and 2018-2019 comparisons. Descriptive analyses were run and presented for overall and in strata of visitation frequency (mean with standard deviations), crude difference in completeness and reaching targets (mean and standard error). In order to evaluate whether the observed differences were confounded, multivariable linear regression models were run in which age, sex, care program (eligible for secondary prevention or

eligible for primary prevention) and general practitioner were taken into account as potential confounders. As sensitivity analyses we repeated the analyses with aggregated scores on general practitioner level, where now visitations involved the practice rather than individual patients.

### **Patient involvement**

Since the study was aiming at data derived from the multidisciplinary information system for integrated care, patients were not actively involved.

### **Ethical considerations**

Data used for the analysis were pseudonymised when extracted from the multidisciplinary information system. Before uploading to the secure network the data was encrypted, implicating that individual patient data were not identifiable during analyses.

### **Results**

The number of patients potentially reached through these visits is presented in table 1. General cardiovascular characteristics of the population is presented in table 2.

#### **Completeness of registration**

The mean score on completeness of registration using the individual patient data was 6.28 (standard deviation 1.35) in 2016, 6.15 (1.65) in 2017 and 6.37 (1.33) in 2018 (table 3). Results using individual patient data showed no clinically relevant improvements in completeness of registration overall. There is a tendency that improvements are larger in practices with 2 or more visitations as compared to those with no or 1 visitation. Yet, the improvement in total score remains small in magnitude, despite reaching statistical significance also when confounding factors were taken into account (table 3, last column). The mean scores using data aggregated on GP level were 6.00 (0.69) in 2016, 6.20 (0.83) in 2017 and 6.38 (0.26) in 2018 (supplementary table 1). Results using the data aggregated on GP level, followed the same pattern: no clinical relevant improvements overall and in practices with no visitations and 1 visitation and small improvements in practices with 2 or more visitations in 2016 and 2017. Visitations in 2018 did not change completeness of registration overall, nor across strata of visitation on GP level in 2019 and analysis did not show different results in either direction, magnitude or clinical relevance (Supplementary Table 1).

#### **Reaching predefined targets**

The mean score on reaching the targets using the individual patient data was 3.21 (SD 1.30) in 2016, 3.28 (1.37) in 2017 and 3.51 (1.28) in 2018 (table 4). Results based on individual patients showed no clinically relevant improvements in reaching targets overall nor in practices with no visitation and 1 visitation and

small improvements in practices with 2 or more visitations in 2016 and 2017. Visitations in 2018 did not show improvements in reaching targets overall in 2019, nor in strata across visitation. Adjustment for potential confounding factors did not affect the findings (table 4, last column).

The mean score on reaching targets using data aggregated on GP level was 3.08 (0.57) in 2016, 3.36 (0.64) in 2017 and 3.56 (0.46) in 2018. Results using the data aggregated on GP level showed no clinically relevant improvements overall and in practices with no visitation and 1 visitation and small improvements in practices with 2 or more visitations in 2016 and 2017. Visitation in 2018 did not show improvements in reaching targets overall in 2019, nor across strata of visitation and analysis did not show different results in either direction, magnitude or clinical relevance (Supplementary Table 2).

### **Results among those GPs ranking lowest 25% of the distribution**

From a clinical perspective, the approach tends to be that modest performing GPs are visited more than once a year. Our findings show that among these groups statistically significant improvements in completeness of registration and reaching the target occurs and its magnitude is more pronounced than that found in the whole population (Supplementary Table 3 for the 2017-2018 period). Yet, these improvements were equally visible, regardless the number of visitations. Although the magnitude of the change seemed more pronounced in the group visited twice or more, the differences between visitation groups were not statistically significant.

## **Discussion**

### **Summary**

In our observational study performed in primary care, we evaluated the value of practice visitations to integrated CVRM in primary care. We observed no improvement in practices that were visited 2 or more times compared to practices with no visitation or 1 visitation. However, in those practices performing according to the lowest 25% on registration and predefined targets, improvements were seen irrespective of the number of visitations. Ideally, one would like to investigate the possible association between improvement in registration and achieved outcomes and a reduction of cardiovascular events. Yet, the care programme and the care groups' multidisciplinary registration were not a priori developed and designed for complete registration of clinical event outcomes.

### **Strengths and limitations**

This study has a number of strengths. First, the large number of participants leads to a high representativeness. Second, because data collection and visitations did not interfere with daily practice routine, this further adds to the generalisability. Third, we included only practices where the GP was employed during the study period, minimizing bias due to changes in practice organization and care giver.

The study has a number of limitations. First, it was a non-randomized, observational study leading to a substantial risk of confounding bias in the estimates of the effect of visitation. Yet, we did adjust for expected confounding factors in our analysis. Second, technical problems or lack of time may have contributed to the fact that targets might not have been registered but were still achieved, leading to an underestimation of the effect. Third, we realize that, as a consequence of the care groups' decision to use binary cut points, reductions in SBP for example, remain unnoticed if the cut-off is not met, leading to underestimation of improvements in some patients. Fourth, prescriptions of BPL and LM medication were used as performance indicator, without knowing whether medication was indicated which could have led to some overestimation. Fifth, PoZoB supported affiliated practices for several years in various ways which have been described in detail, resulting in annual improvements of performance (9). This might have contributed to the lack of effect on performance of additional practice visitations.

### **Comparison with the literature**

The results of our study are in contrast with a systematic review in 2012 that concluded that A&F overall leads to positive but highly variable effects (5). A&F showed positive effects in some studies on hypertension management and prescription rate (11-14), while in other studies on adherence to guidelines and decrease in first ever strokes it did not (15,16). Comparison of these studies with our study is, however, difficult because of the heterogeneous designs, interventions tested and the difference in primary outcome. There is a number of reasons that possibly contribute to the lack of results in our study. First, overall mean registration rate was already high in 2016 (17), making it difficult for practices to realize further improvements. Second, absenteeism due to illness of primary care staff and lack of replacement can ensure that regular follow up is lagging behind, resulting in poorer registration (18). Third, due to privacy restrictions, it was not possible to take caregivers characteristics such as age, sex and number of years working as a GP into account. Finally, GPs and PNs may have clinical considerations for not reaching targets such as older age combined with side effects of medication, polypharmacy, the patients' reluctance to intensify therapy and near-target indicators (19).

### **Implications for future research and clinical practice**

Research showed that feedback was more effective if performance was low, if given face to face by a colleague, on more than one occasion and with well-defined goals (6,20). The current study showed that feedback given during annual visitations was not of additional value regarding improvements in clinical performance. Practice visitations however, could be used i) to explore whether the general practice is motivated to improve ii) to explore what a practice needs to improve and iii) to emphasize the non-punitive character of A&F in order to maintain a trustful relationship. Future research could focus on the



reasons why GPs and PNs deviate from current guideline targets. Furthermore, individual patient targets registered as such in the care groups' multidisciplinary registration system, should be taken into account when evaluating practice performance. Finally, given the fact that practice visitations are a time consuming and therefore costly operation, care groups may consider other possibilities to support health care providers, such as interventions aimed at improving patient self-management skills, taking the patients preferences into account and consider the patient as a partner as this patient-centred approach is aiming less on performance but more on a better health related quality of life and more satisfied health care providers (21,22).

### **Conclusion**

Practice visitations in our setting did not seem to lead to improvements in practice performance, nor in completeness of registration of risk factors or in reaching predefined target goals for cardiovascular risk factors.

### **Notes**

**Ethical approval** The pseudonymized data used were only accessible in the secured research environment of the PoZoB primary care group. No formal assessment by the medical ethics committee of the Utrecht University Medical Centre was necessary because of the retrospective nature of research using non-traceable information.

**Data availability** Data for this article were provided by the PoZoB primary care group. Data will be shared on request to the corresponding author with the care groups' board permission.

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**Competing interests** The authors have declared no competing interests.

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**Box 1. Items discussed with the practice during visitation.**

- Is the practice using a result-orientated approach (focus on how to interpret information from the quarterly reports and improving to at least the minimum standard)?
- Is the practice applying or, if necessary, deviating from guidelines?
- Is there regular and structured consultation between GP and PN and is there agreement on the follow up policy so the PN feels supported by the GP?
- Is there adequate mail processing and registration in the multidisciplinary information system?
- Does the PN have sufficient hours in relation to the workload?
- Is there discontinuity due to illness of the GP or the PN?
- Are there major differences in practice population?
- Are there linking problems with a laboratory, electronic registration system or multidisciplinary registration system?

Table 1. Characteristics of the study population: practices, visitation, and number of patients potentially reached by the visitations				
Year		2016	2017	2018
Practices participating in the study		128	128	128
Number of visitations per practice:				
	No visitation	38	37	27
	1 visitation	87	71	79
	2 visitations	3	16	20
	3 visitations	0	4	2
Patients potentially affected through the visitation (N):				
	No visitation	11492	11814	8543
	One visitation	26678	20999	23508
	Two or more visitations	1277	5642	7083
	Total patients involved	39447	38275	39134

Table 2. Mean characteristics of the studied population, by year.

	2016 (N=39447)		2017 (N=38275)		2018 (n=39134)	
Age (Mean, SD)	69	10	69	10	70	11
Women (%)	52		52		52	
High risk patients without CVD (%)	59		56		55	
Smoking (%)	13		12		12	
Sufficient PA (%)	76		76		76	
BPL-medication (%)	63		66		68	
LM-medication (%)	49		55		54	
eGFR $\geq$ 60 ml/min/1,73m <sup>2</sup> (%)	79.8		78.6		79.7	
	Mean	SD	Mean	SD	Mean	SD
Alc (drinks/day)	0.84	1.2	0.82	1.1	0.83	1.1
BMI (kg/m <sup>2</sup> )	27.3	4.3	27.4	4.6	27.3	4.5
SBP (mmHg)	136	15.7	136	15.5	135	15.5
LDL (mmol/l)	2.8	0.91	2.7	0.89	2.4	0.82

N: number of participants with the characteristic; PA: Physical Activity, based on the Dutch norm for healthy movement; BPL: blood pressure lowering medication; LM: Lipid modifying medication; eGFR: estimated Glomerular Filtration Rate  
Alc: Alcohol; SBP: Systolic Blood Pressure; LDL: Low Density Lipoprotein cholesterol; BMI: Body Mass Index;

Table 3. Completeness of registration of CVRM information using individual patient records.

	Mean completeness score (SD) year 1	Mean completeness score (SD) year 2	Mean difference between score (SE) (year 2 - year 1)	Multivariable # difference (99% CI)
2016-2017				
Overall	6.28 (1.35)	6.28 (1.39)	0.003 (0.010)	NA
0 visitations	6.33 (1.32)	6.28 (1.37)	-0.045 (0.018)	ref value
1 visitation	6.27 (1.35)	6.28 (1.39)	0.009 (0.011)	0.077 [0.021; 0.133]
2 or more visitations	5.93 (1.55)	6.27 (1.41)	0.338 (0.058)	0.355 [0.208; 0.503]
2017-2018				
Overall	6.12 (1.71)	6.37 (1.33)	0.250 (0.011)	NA
0 visitations	6.20 (1.53)	6.41 (1.29)	0.202 (0.018)	ref value
1 visitation	6.30 (1.34)	6.36 (1.34)	0.054 (0.013)	-0.089 [-0.14; -0.032]
2 or more visitations	5.21 (2.68)	6.31 (1.39)	1.104 (0.041)	-0.152 [-0.239; -0.065]
2018-2019				
Overall	6.37 (1.33)	6.34 (1.35)	-0.032 (0.009)	NA
0 visitations	6.38 (1.32)	6.26 (1.43)	-0.120 (0.020)	ref value
1 visitation	6.35 (1.35)	6.34 (1.35)	-0.012 (0.012)	0.106 [0.044; 0.167]
2 or more visitations	6.42 (1.27)	6.43 (1.25)	0.011 (0.021)	0.121 [0.041; 0.201]
<p># adjusted for year specific age, sex, care program and general practitioner using a multivariable linear regression model with the difference in score as dependent variable.</p> <p>SD= standard deviation; SE = standard error; CI= confidence interval</p>				

Table 4. Reaching predefined targets using individual patient records.

	Mean number on target (SD) year 1	Mean number on target (SD) year 2	Mean difference between score (SE)	Multivariable # difference (99% CI)
2016-2017				
Overall	3.21 (1.30)	3.36 (1.28)	0.144 (0.009)	NA
0 visitations	3.22 (1.31)	3.31 (1.28)	0.089 (0.017)	Ref value
1 visitation	3.22 (1.29)	3.37 (1.28)	0.147 (0.011)	0.067 [0.16; 0.12]
2 or more visitations	3.02 (1.34)	3.59 (1.23)	0.573 (0.050)	0.450 [0.32; 0.59]
2017-2018				
Overall	3.28 (1.37)	3.51 (1.27)	0.230 (0.010)	NA
0 visitations	3.32 (1.32)	3.53 (1.26)	0.215 (0.017)	Ref value
1 visitation	3.41 (1.25)	3.50 (1.28)	0.090 (0.012)	-0.091 [-0.144; -0.038]
2 or more visitations	2.72 (1.72)	3.53 (1.25)	0.805 (0.030)	0.017 [-0.063; 0.097]
2018-2019				
Overall	3.51 (1.28)	3.48 (1.26)	-0.0308 (-0.009)	NA
0 visitations	3.52 (1.29)	3.46 (1.26)	-0.0552 (0.012)	Ref value
1 visitation	3.52 (1.27)	3.48 (1.26)	-0.0416 (0.012)	0.060 [-0.052; 0.065]
2 or more visitations	3.46 (1.28)	3.50 (1.24)	0.0344 (0.022)	0.132 [0.056; 0.208]
<p># adjusted for year specific age, sex, care program, and general practitioner using a multivariable linear regression model with the difference in score as dependent variable.</p> <p>@ targets are assessed for only those that have at least one measurement that determine the target score.</p>				