# From protocol to personalised care: improving and tailoring diabetes management in general practice

Bruggen, S. van

# 7

# Background

Type 2 diabetes mellitus (T2DM) is a chronic condition that occurs when the body cannot effectively use insulin. The function of insulin is to ensure that glucose in the blood, derived from the digestion of food, is taken up by cells throughout the body. Too little or too much glucose in the blood can cause both short-term and long-term health problems, some of which can be very serious. Insensitivity to insulin leads to a higher than normal level of HbA1c, a blood measurement that gives an indication of the amount of glucose in the blood. Over time, a structurally elevated HbA1c level can cause serious harm, resulting in heart and cardiovascular diseases, blindness, limb amputation and early death. Fuelled by an aging population and a growing prevalence of (serious) overweight, the number of T2DM cases has risen dramatically worldwide. The Netherlands is no exception.

The steep increase in T2DM cases in the Netherlands has begun to affect the delivery of care in Dutch general practice. In order to catch and treat risks of health deterioration at an early stage, effective diabetes care requires frequent monitoring of diabetes-related health parameters such as HbA1c. In addition, many people need support regarding weight loss, quitting smoking and increasing their physical exercise – in other words, help developing a healthier lifestyle. To achieve and maintain a healthy lifestyle, people must develop the ability to effectively manage their T2DM. This is known as 'self-management', and frequent coaching is often needed to encourage the development of self-management skills. Given these many demands, diabetes care places considerable pressure on general practice.

In order to improve primary diabetes care in the Netherlands, in 2007 a 'local care group' system was initiated. The goal of care groups is to tackle problems that hinder the delivery of diabetes care, such as time pressure, difficulties staying up-to-date in the face of an expanding diabetes population and challenges concerning task delegation from general practitioner (GP) to nurse practitioner. The care group approach entails offering specific services to participating GP practices, including a structured care protocol. This care protocol consists of four diabetes consultations for each diabetes patient in the GP practice. Diabetes consultations comprise monitoring of specific biomedical blood parameters (such as HbA1c and cholesterol) and the encouragement of self-management skills in order to stimulate a healthy life style. Practices receive support concerning implementation of the care protocol and task delegation from GPs to nurse practitioners. Furthermore, many care groups facilitate the use of digital systems that are linked to electronic health records. These systems help provide a clear picture of the diabetes care delivered by a GP practice to an individual patient. Another important function of care groups is to support GPs during negotiations with healthcare insurance companies. For

example, care groups negotiate with insurance companies regarding the contents of the care protocol, reimbursements and targets concerning care provision, such as the percentage of people with at least one systolic blood pressure measurement per calendar year.

In the last few years, doubts have been raised regarding the care group approach. Some people feel that care groups add little clinical value to patient care, while bringing high costs and an additional bureaucratic load. A structured care protocol can also seem to be a barrier if the aim is to tailor diabetes care to people's individual needs.

In this thesis, we first studied the association between adherence to a structured diabetes protocol and patient outcomes. We then investigated what practices actually require when seeking to adjust care to patient needs. With that aim in mind, we explored the effect of dispensing with protocol and the key conditions for successful implementation of self-management interventions. Finally, we measured patient outcomes with regard to treatment satisfaction, quality of life and monitoring.

# Findings of this dissertation



**A structured care protocol has added value for people with diabetes**

We first investigated whether care group participation is associated with improvement of diabetes monitoring (chapter 2). Monitoring was defined as 'appropriate' if during a calendar year at least one measurement was registered for each of three biomedical target indicators (HbA1c, systolic blood pressure, cholesterol) and three lifestyle-related target indicators (body mass index, smoking behaviour and physical exercise). This definition is based on the professional GP guidelines for type 2 diabetes care in the Netherlands and is referred to here as 'recommended monitoring'.

To get a picture of the effect of care group participation on recommended monitoring, we conducted two analyses. The first was carried out using data from all six practices that joined the Eerstelijns Zorggroep Haaglanden (ELZHA) care group, a care group in The Hague and suburbs, in January 2014. In 2019, this care group was integrated with other local GP organisations to become the Haaglandse Dokters (Hadoks) organisation. In the new practices that joined in January 2014, we explored whether the number of people receiving recommended monitoring was higher at the end of 2014 compared with January of that year. This was indeed the case, and recommended monitoring was found to be substantially higher at the end compared to the beginning of 2014.

Second, we examined whether recommended monitoring at one year in these new practices differed from that in experienced practices which had participated in the care group for at least three years. This analysis found no significant differences between new and experienced practices. To summarise, practices likely undergo an intensive learning process when they join a care group and appear to reach the same level as experienced practice within a year.

Chapter 3 explores the added value of recommended monitoring for people with diabetes. We therefore compared HbA1c levels in people with recommended versus incomplete monitoring with regard to calendar year 2014. Professional GP guidelines in the Netherlands define maximum HbA1c values for three distinct patient groups. These three groups are characterised by risk profiles related to age, treatment characteristics and the duration of diabetes. Group one consists of people younger than 70 years, as well as older people with only metformin monotherapy prescription, and has a maximum value of 53 mmol/mol. Group two includes people older than 70 years who require more diabetes medications but have had the disease for less than ten years. The maximum value in this group is 58 mmol/mol. The third group includes the most vulnerable people – older than 70 years, on intense medication prescription and a disease duration of more than 10 years – and has a maximum value of 64 mmol/mol.

We compared the HbA1 levels of people with recommended and incomplete monitoring in all three groups. We found that the HbA1c levels in people with recommended monitoring are significantly circa 2 mmol/mol lower compared to incomplete monitoring. In other words, recommended monitoring is far more than merely an administrative procedure; it actually reflects better real-world HbA1c levels.

### Outcomes differ between distinct groups with diabetes

*Health benefits are the highest among socioeconomically vulnerable people*

The Hague and its suburbs are characterised by large differences in socioeconomic status (SES). To investigate the impact of SES we compared advantageous and deprived neighbourhoods with regard to recommended monitoring, HbA1c levels and the association between these factors. This study is described in chapter 4.

For the purposes of this study, all practices in The Hague received a so-called 'deprivation score', which is registered by The Hague municipality and divided into three categories: deprived, advantageous or intermediate. The suburbs of The Hague (Wassenaar, Leidschendam-Voorburg and Voorschoten) were assigned to a 'suburban advantageous' category.

When advantageous and deprived neighbourhoods were compared to the intermediate category, we found that all areas of The Hague, together with advantageous suburban areas, were comparable in terms of recommended monitoring. Despite this finding, HbA1c levels were significantly lower in the deprived category (a difference of circa 2 mmol/mol).

We also examined whether SES categories differed with regard to the association between monitoring and HbA1c levels. Differences in HbA1c level between people with recommended versus incomplete monitoring were greater in the deprived group, to the extent of approximately 3 mmol/mol, whereas a circa 1 mmol/mol difference was found in the intermediate category. In other words, within a care group setting people in the deprived category derive the most benefit from recommended monitoring.

In view of the fact that a vulnerable SES is an established factor lowering the chance of favourable health outcomes, for example due to limited health literacy, this is an interesting finding. We know from scientific literature that professionals sometimes face difficulties when providing care to diabetes patients with a vulnerable SES, specifically in terms of lifestyle coaching. GPs and nurse practitioners often express doubt concerning the added value of lifestyle coaching and their personal ability to provide appropriate support to this group. Furthermore, professionals might hesitate for fear of negatively affecting their relationship with the patient. Nonetheless, appropriate monitoring of biomedical indicators and an adequate focus on lifestyle coaching is reflected in substantially better HbA1c levels, especially in this group.



**Tailoring care to different groups: 'Free of protocol'**

As described in chapter 5, four GP practices that were classified as well-organised according to Hadoks quality standards, participated in the 'Free of protocol' initiative. This study was designed to stimulate the development of tailored care for people with diabetes, and entailed investigating the effects of protocol-free care and the key conditions for successful implementation of self-management interventions.

Participating practices had the opportunity to dispense with the structured care protocol in a relatively safe population – people with a comparatively good HbA1c level who had received structured diabetes care for at least a year. Practices could choose one or more interventions from a broad variety of self-management options inspired by a nationally approved 'toolkit'. Practices subsequently prepared an implementation plan based on practice-specific insights and used this plan as the basis for implementation.

We examined practices' experiences with protocol-free care by organising group meetings and interviews with individual practice members at the practice location. This allowed us to evaluate the proceedings of the implementation process in each practice. In addition, we mapped the experiences of individual patients with protocol-free care and the self-management interventions as implemented by the practices. Patients filled out written questionnaires measuring satisfaction with diabetes care, general wellbeing and self-rated health. We also determined the extent to which the number of people with recommended monitoring remained at an appropriate level.

This study revealed the following findings:

### Effect of protocol-free care: room for reflection concerning 'tailored care'

The opportunity to dispense with a structured diabetes protocol was experienced in most practices as liberating. However, there was also some uncertainty and with protocol compliance no longer necessary, some practices experienced difficulties defining suitable care for their patients. Nevertheless, most practices indicated that departure from protocol created room to reflect on how diabetes care in their practice could be optimally tailored.

Practices differed with regard to SES neighbourhood and, correspondingly, patient characteristics such as health literacy. This diversity was mirrored in the self-management interventions chosen; these ranged from an SMS reminder service to improve attendance of a vulnerable SES population at diabetes consultations, to a digital portal - in an advantageous neighbourhood - that enabled people to independently monitor their health outcomes and to proactively prepare for a diabetes consultation.

### Key conditions for successful implementation of self-management interventions

**- An eye for the needs of the patient population**

Although patient needs differed considerably between practices, for practices a clear view of patient needs was a strong incentive to carry out a thorough implementation process. When the implementation process took more time than foreseen or if practical or logistical setbacks arose, keeping the patient perspective in mind seemed to provide practices with sufficient incentive to finish the task.

**- Collaboration within the practice team**

Strong collaborations between different GP practice disciplines – GPs, nurse practitioners, medical assistants – was very important to the implementation process. Extensive discussion concerning the intended intervention(s), the development of an implementation plan supported by all team members and sufficient consideration given to logistical processes all contributed to a smooth implementation.

**- Feasibility of interventions**

We found that instruments need to function appropriately. This was not the case with the digital patient portal, the implementation of which was hindered by technical shortcomings from the perspective of both the care provider as well as the patient. This intervention was not part of the toolkit, but was chosen because it had recently become available and was already integrated with the electronic diabetes management system used by all practices. However, during the course of the study it became apparent that it was not yet ready for daily practice use. Keeping in mind that appropriate assessment requires specific technical expertise combined with insight into user experiences, assessment of the feasibility of eHealth instruments can be difficult for GP practices. Therefore, when considering this approach we recommend collaboration with expert academic centres that have sufficient specific knowledge and can provide independent advice.



## Impact on people with diabetes

We found that the number of people with recommended monitoring declined over the study period. At first sight, this appears worrying. However, it also raises the question of the extent to which the definition 'monitoring as recommended' is applicable to people with a long-term, stable HbA1c level that remains below the recommended maximum value. In addition, patient satisfaction also decreased slightly, underlining the importance of sufficient focus on patient needs with regard to diabetes care.

Our results reflect the international discussion of why self-management interventions so often appear of limited value. Some have suggested that, given the urgencies of daily practice, GP practices often assign insufficient priority to the careful implementation of interventions in research settings. Others suggest that different kinds of incentives are required to encourage appropriate implementation. In our opinion, our studies reveal some of those incentives: the ability to depart from care protocol and the freedom to choose interventions that fit the practice and the specific patient population. These factors appear to be important motivators for practices to maintain focused efforts and to achieve a good implementation.

Remarkably, and despite satisfaction with many of the implemented measures, overall satisfaction concerning patient outcomes declined slightly over time. With regard to the present study and given our study setting, no causal inferences can be drawn as we cannot determine the extent to which diminished satisfaction was related to the study setting itself. Nevertheless, other work indicates that a reduction in consultations is associated with lower satisfaction. Furthermore, the number of people receiving recommended monitoring also declined. In the context of Dutch professional GP guidelines, this appears at first sight to be an unfavourable outcome. Nonetheless, given the fact that enrolment in the study was dependent on stable diabetes control, one might question whether these individuals really need annual monitoring of all target indicators. Until this question is resolved satisfactorily, we recommend at least one annual diabetes consultation.

# Conclusions and recommendations

A number of conclusions can be drawn from the studies described in this dissertation.

Firstly, our cohort studies clearly show that the participation by GPs in a care group adds value for patients: the number of people with recommended monitoring in accordance with GP guidelines increases considerably. While it can never be ruled out that care has been delivered but is not registered as such, perhaps due to technical reasons, a clear difference is apparent in the HbA1c levels of people with recommended versus incomplete monitoring: people with recommended monitoring have significantly better HbA1c levels. This finding allows us to conclude that structured diabetes care, with collective support in a care group setting, is associated with better patient outcomes.

Furthermore, weaker socioeconomic differences are apparent in a structured care setting, as equal numbers of people receive recommended monitoring regardless of the SES neighbourhood. Importantly, the deprived category derived the greatest benefit from recommended monitoring, showing higher than average monitoring-related HbA1c differences. This finding argues for care that is as closely tailored to people's needs as possible. Once practices have properly organised structured care, protocol-free care might encourage further tailoring of care. Consideration of the needs of patients, appropriate collaboration within the practice team and implementation-ready interventions can all contribute to personalised care delivered with dedication and commitment.

Taken together, these conclusions also raise new questions and chapter 6 provides several recommendations for follow-up research. All studies in this dissertation were, following careful consideration, based on an observational study design. The downside of this approach is that we could not determine the extent to which the care group setting contributed one-by-one to better monitoring, or in turn, if better monitoring directly results in favourable HbA1c outcomes.

To obtain deeper insight into the effects of collective support and a structured care protocol on health outcomes, additional research is welcome. Given the diversity in individual practices with regard to factors such as type of organisation, practice size and educational level of nurse practitioners, a better understanding of the requirements and experiences of individual practices is needed. It cannot be ruled out that practices differ concerning needs for support in the delivery of diabetes care. Moreover, support from the care group perspective is characterised by providing practices with structure on the one hand and flexibility on the other. To find an optimal balance between structure and flexibility that recognises the diversity of practices, we endorse a better understanding of when practices are ready for departure from protocol.

There are also indications that task delegation to nurse practitioners is associated with lower work satisfaction amongst GPs. To achieve sustainable diabetes care in the future, more research into factors that contribute to improved satisfaction is also recommended.



Our studies provided fresh insight regarding the association between diabetes care within a care group setting and patient outcomes. Given perceptions of the care group system as expensive and of limited cost-effectiveness, we would also encourage the systematic investigation of financial costs in relation to clinical outcomes.

Based on our overall findings, we propose the following roadmap:

### A roadmap to strong, personalised diabetes care

1. **Work from a solid base**

   When implementing structured diabetes care, use a protocol that provides systematic support

2. **Look before you leap: determine the shape of tailored patient care in your own practice**

   Take the necessary time to consider the question of what 'tailored care' will mean for patients in your own practice; actively explore patient needs and values, ensure smooth collaboration within your team and carefully consider the feasibility of interventions within the practice

**3. Don't forget the individual patient**

Regardless of the selected intervention, make certain that every patient is seen at least once a year

**4. Keep in mind the specific SES-dependent care needs**

Take into account that 'personalised care' for people with a vulnerable SES background might mean that these individuals need extra support concerning their diabetes care

This roadmap is intended as a summary for GP practices that wish to provide optimal diabetes care. When working from a solid base, care that accommodates patients' needs is an achievable goal.