Type 2 diabetes

Assessing and optimising medication adherence

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Increased rates of obesity, sedentary lifestyles and an ageing population have all contributed to the significant increase in the number of people with type 2 diabetes in Australia.

The prevalence of type 2 diabetes has increased from 1.5% in 1989–90 to 4.4% in 2014–15. There is currently an estimated 1.2 million people diagnosed with type 2 diabetes in Australia.[1,2] With conclusive evidence that intensive control of risk factors for glycaemia and cardiovascular disease (CVD), including blood pressure and lipid levels, can reduce the risk of complications of type 2 diabetes, the application of evidence-based treatment to achieve appropriate therapeutic targets is crucial.[3,4] For most patients, this involves the use of several medications.

In Australia, studies in primary care populations have consistently demonstrated that significant numbers of patients with type 2 diabetes are not at the recommended therapeutic targets, thereby increasing their risk of disease complications.[5-7] Reluctance among both clinicians and patients to initiate or intensify therapy is a common reason for failure to achieve these targets. Another key contributor is nonadherence by patients to medication and other self-management activities.

Key points

- **Nonadherence to medication contributes to poorer outcomes in patients with diabetes.**
- **About one in three patients with diabetes do not take their medication as prescribed.**
- **Factors contributing to medication adherence that are amenable to influence by a healthcare professional fall into three broad categories: patient related, medical/treatment related or related to the process of health care.**
- **Each consultation or encounter is an opportunity for the GP to review how the patient has been managing and taking their medication.**
- **GPs can assist patients to optimise their medication by adopting a stepwise approach identifying that a patient is not using their medication, exploring the reasons for this and implementing targeted strategies to address underlying barriers.**

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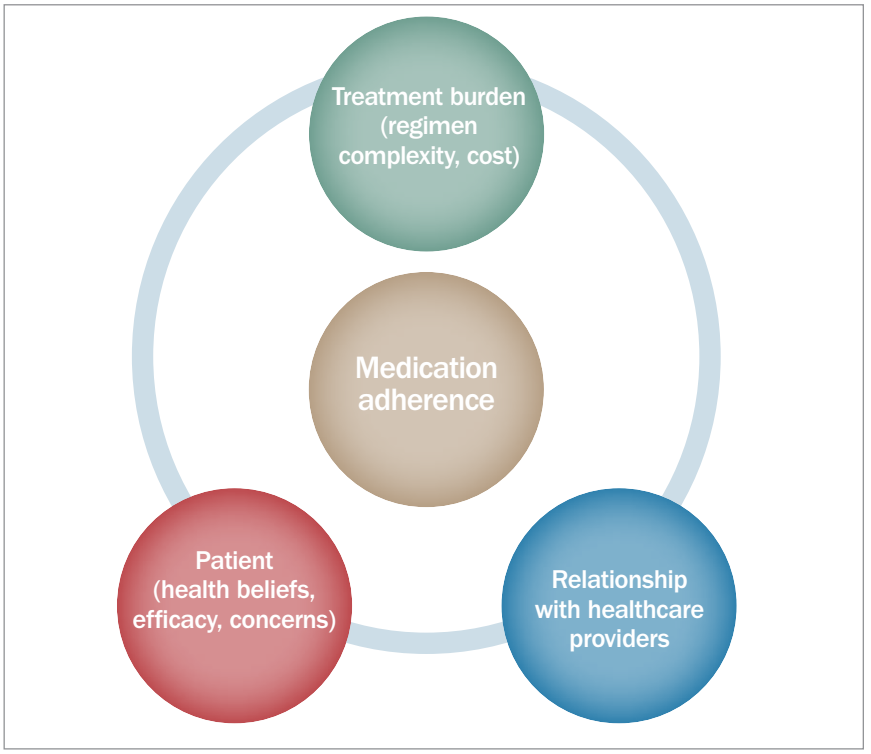

Figure 1. Modifiable factors affecting medication adherence.

Medication adherence

The term 'medication adherence' has been defined as the extent to which a medication is taken at the prescribed intervals, dosing and frequency.[8] 'Persistence to medication' refers to continuation of therapy such that if the patient stops taking their medication without prescriber agreement for any reason they are said to be 'nonpersistent'. The consequences of poor medication adherence and/or nonpersistence include poorer glycaemic control, increased use of healthcare resources, higher medical costs, and greater morbidity and mortality.[8,9] For example, taking less than 40% of recommended doses has been shown to lead to an increase of 0.4% in glycated haemoglobin (HbA_{1c}) over a two-year period in patients newly diagnosed with type 2 diabetes.[10]

International evidence suggests that adherence to medication in type 2 diabetes is less than optimal and highly variable. A 2015 systematic review reported adherence rates ranging from 38.5 to 93.1% and noted widely varying definitions of adherence and methodological approaches to measuring adherence among included studies.[11] Collectively this review and other studies (both Australian and international) highlight that adherence to diabetes medication is a global challenge.[12,13]

Patterns of nonadherence

The first year after starting a medication for a chronic condition poses the highest risk for medication nonadherence and appears to be consistently driven by three patterns of medication-taking behaviour: primary nonadherence, nonpersistence and poor execution.[14] Patients who receive a prescription but never actually collect the medication exhibit primary nonadherence, reported to be between 4 and 31% for antidiabetic therapies. Early nonpersistence or discontinuation of treatment contributes disproportionately to overall nonadherence in the first year of therapy. Considering the high rates of primary nonadherence and early nonpersistence observed with all glucose-lowering medications, greater vigilance is required for patients starting any type of antidiabetic therapy.[14]

GPs seeking to promote adherence should focus on identifying and addressing modifiable factors known to contribute to poor adherence to medication.

Factors influencing adherence

Many factors contribute to nonadherence. Moreover, reasons for not adhering or persisting with medication may vary within the individual and change over time, highlighting the importance of ongoing assessment at each medical consultation. Understanding the various patterns of nonadherence is important, as widely acknowledged nonadherence factors such as forgetfulness or complexity may not be applicable to a high proportion of nonadherent patients.

There are three broad categories of modifiable factors associated with medication adherence that we have outlined below: patient-related factors; medical and treatment-related factors; and healthcare-related factors (Figure 1).

Patient-related factors

Beliefs about medication, whether positive or negative, have a significant impact on adherence to medication and may lead to intentional nonadherence. This occurs when a patient makes a conscious decision not to take their medication.[15] Scepticism about the necessity and/or efficacy of medication, as well as concerns about adverse effects associated with long-term use of medication, are key examples of influential beliefs. Concern about negative impacts of medications has consistently been shown to be more strongly predictive of adherence to medication than beliefs regarding the necessity for treatment in a range of conditions.[16] An association between adherence and concern about adverse effects was also reported for the aforementioned cross-sectional study of 543 Australian patients with type 2 diabetes. Respondents who reported greater concerns about medications were less likely to be adherent.[13] Moreover, many people with diabetes experience mental health conditions, including diabetes-related distress and

depression, that may negatively impact on diabetes self-care including adherence to medication. If this is the case, patients may require direct interventions to treat the underlying mental health challenges being faced.[17]

Unintentional nonadherence occurs when the patient wants to follow the agreed treatment but is unable to do so because of factors that are beyond their control, such as forgetfulness, the absence of cues to take medications or collect new prescriptions, or misunderstanding of instructions.[15]

Medical and treatment-related factors

Comorbid conditions, especially depression, have consistently been linked with poorer adherence to antihyperglycaemic therapy in patients with type 2 diabetes.[13,18,19] This highlights the need to be vigilant in the assessment of potential distress or depression in those apparently not responding to treatment.

Features of the medication regimen itself have also been shown to affect medication adherence. The greater the regimen complexity, including number of doses, dosage form, dosing frequency and any other administration requirements that increase patient burden – defined as the impact of the 'work of being a patient' on functioning and wellbeing – the lower the adherence to antihyperglycaemic therapy.[20,21] Experiences of medication-related adverse events have also been linked to nonadherence.[22] Hypoglycaemic episodes are one of the most prominent adverse events that reduce medication adherence and promote discontinuation of therapy.[20] Another side effect linked to nonadherence is weight gain. It is associated with some antihyperglycaemic therapies including insulin, thiazolidinediones and sulfonylureas, suggesting that if weight gain is a concern for patients it should be taken into account in the selection of a second agent to improve glycaemic control.[23]

Cost of treatment has also emerged as an important key barrier to adherence in places where the patient is burdened with significant out-of-pocket expenses.[13,24] Affordability-related nonadherence commonly manifests as delays in attending a GP to get a prescription (to avoid medical fees) and delays in or failure to collect prescriptions.

Healthcare-related factors

Quality of communication and trust in physicians has been reported to influence adherence of patients with diabetes to antihyperglycaemic and antidepressant medications.[20,25] A US survey of a random sample of 9377 patients investigated patient perceptions of their interactions with healthcare professionals. Respondents who gave healthcare providers lower ratings for involving patients in decisions, understanding patients' problems with treatment and eliciting confidence and trust were more likely to have poor adherence to a range of cardiometabolic medications; more so for antihyperglycaemic medications than for other medications.[26]

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The importance of strong patient-doctor relationships may extend to other healthcare professionals, as suggested in a survey of members of Diabetes Australia NSW where respondents were less likely to be adherent if they attended more than one regular pharmacy.[13] These may include credentialled diabetes educators, dietitians, diabetes nurse practitioners, endocrinologists, GPs, pharmacists, podiatrists, counsellors, psychologists, psychiatrists, social workers, exercise physiologists, optometrists and dentists.[27]

Moreover, Australian patients with diabetes have directly expressed concerns about care fragmentation.[28] They had a strong preference to see the same care providers to ensure continuity of comprehensive, co-ordinated and integrated diabetes care, as well as continuity and consistency of information.

Interventions to improve adherence – what works?

Several approaches to improving medication adherence have been trialled with varying success. Most interventions have focussed within the broad category of reducing treatment burden – primarily on the problem of medication behaviour rather than medication attitudes.[20] Examples include educational programs, disease management programs and intensive behavioural support to address personal barriers to adherence; and simplification of dosage regimens, dose administration aids and reminders to tackle medication-related barriers. The evidence suggests that the most successful interventions, in the short term, have been multifaceted – that is, combining educational and behavioural elements to reduce the burden of medication taking (e.g. numbers of doses, reminders) and empower patients with the knowledge, motivation, support and skills to self-manage their medication.[29] In the Australian context, a commonly used strategy to improve adherence is the use of dose-administration aids such as blister packs. Evidence from a systematic review, however, suggested only limited impact of this type of intervention with an 11% (95% CI, 6 to 17%) improvement in the percentage of pills taken.[30] Few studies have tested interventions designed to specifically influence emotional and cognitive issues that may affect how a patient balances their beliefs about necessity for the medication versus their concerns in deciding whether or not to adhere or persist with taking their medication.[31]

How can GPs more effectively address suboptimal adherence to medication?

The key to improved medication adherence is to build rapport and strengthen communication between the GP and patient. Adopting a patient-centred approach where patients are actively involved in decisions about their therapy and enabled to clarify their understanding of the risks and benefits of treatment will motivate them to adhere to their therapy. Recognising that ultimately it is the patient who controls

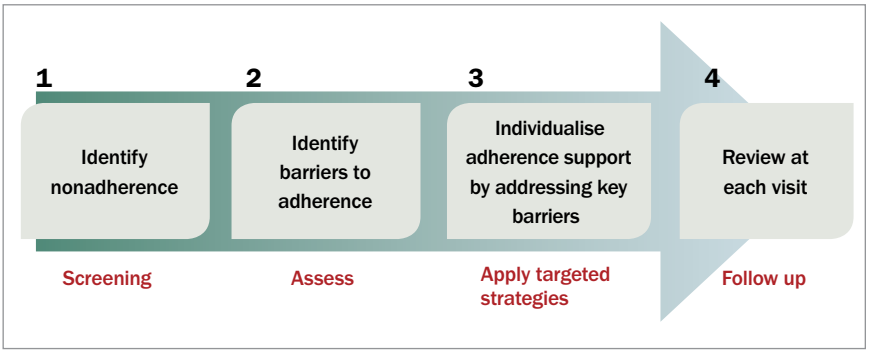

Figure 2. A stepwise approach to medication adherence support in primary care.

their medication taking, the GP can work with the patient to identify their individual barriers and help find solutions that the patient is willing and able to implement and sustain in the long term.[31]

A stepwise approach to providing adherence support is shown in Figure 2.

Identifying nonadherence

Diverse tools and questionnaires have been developed with the aim of accurate assessment of nonadherence. However, these are not practical in a clinical context. The following are questions that may be asked to determine actual adherence behaviour:

- How have you been taking your medicines?
- People often have difficulty taking their pills for one reason or another and I am interested in finding out any problems that occur so that I can understand them better. Do you ever miss taking your medication? How often? When you feel better, do you sometimes stop taking your medicine?
- Most patients tell me that they find it difficult to take their medication every day. Over the past week how many times would you say you have skipped or forgotten to take a medication?

The second and third questions above have the advantage of normalising the behaviour and reducing patient perceptions of judgement that might hinder an open conversation. Consequently, these approaches are more effective than a direct question asking the patient if they have been taking their medication.[32]

Identifying barriers to adherence

Key modifiable barriers amenable to influence by GPs include knowledge (e.g. poor understanding of the condition, medication regimen and its elements such as dosage schedule, treatment duration, purpose); motivation (e.g. health beliefs and emotions); side effects; medication management; and access (e.g. affording the cost of all necessary medications).[33]

Knowledge

Possible questions to elicit patient understanding of diabetes and its treatment:

- Please tell me what you know about diabetes
- How can diabetes affect your health?
- How do you think these medications help your diabetes?

Motivation

Possible questions to elicit patient concerns/anxiety about their condition, therapy, doubts regarding medication efficacy, benefits or need for therapy:

- How do you think your diabetes is going?
- How do you feel about the medications you take?
- How well do you think your treatment is working?

- How would you feel about adding insulin to your treatment plan?
- I imagine that you may sometimes worry about your diabetes and the medicines you use to treat diabetes. What things worry you the most? Once I know what worries you the most, we can work together to come up with a treatment plan that you are comfortable with and can follow.

Side effects

Possible questions to elicit patient experiences of any bothersome side effects or concerns about long-term effects:

- Do any of your medications bother you in any way?
- In what way does it/they bother you?
- What concerns, if any, do you have about your medications?

Medication management

Possible questions to elicit patient difficulty with managing medications:

- I'm going to ask about some problems that people sometimes have with their medications.
- Please tell me how hard or easy it is for you to do each of the following:
  - open or close the medicine bottle
  - give yourself injections
  - read the print on the bottle
  - remember to take all the tablets/give yourself injections
  - get your repeats on time
  - take so many medications at the same time.

Access

A possible question to elicit a patient's ability to meet the out-of-pocket expenses of their medication:

- Do you have any problems paying for your medication?

Appropriate interventions to address specific barriers

If nonadherence has been identified and the reasons contributing to this have been elicited, the GP is well placed to apply specific targeted strategies to address each of the identified barriers for this individual patient.

Table. Interventions targeting specific barriers to adherence

Barrier type	Barrier subtype	Strategy
Knowledge	Deficits in understanding	Educate the patient about their medication Give written information (e.g. Diabetes Australia information, consumer medicines information)
Motivation (health beliefs)	Concerns: is the medication really needed? Is it working?	Tailor information to meet the needs of the patient
Side effects (medication)	Adverse drug reactions	Recommend an alternative medication – consider safety profiles
Medication management	Forgetfulness/changes in routine	Select a reminder or cue such as a clock time, meal time or bathroom ritual that fits into the patient's lifestyle
	Physical difficulties (e.g. co-ordination, eyesight)	Use repeat refill reminders (phone call, SMS, email) Large print, special devices
	Complex regimen	Remove unnecessary medicines Consider nonpharmacological alternatives Co-ordinate administration times with routine daily activities Decrease the administration frequency by using sustained-release or long-acting medicines (i.e. once daily regimen) Use fixed-dose formulations that combine two or more medicines
Access	Cost	Suggest generic/fixed-dose combination therapy

A summary of intervention strategies that match each of the categories of barriers is shown in the Table.

For any individual patient, the factors contributing to poor adherence will necessarily change over time and review of adherence is essential at each follow-up consultation. Efforts to improve adherence can be enhanced when GPs collaborate with pharmacists, as the healthcare professionals most closely involved in the medication-use process. Pharmacists can monitor collection of repeat prescriptions enabling detection of potential nonadherence or persistence. When the medication is collected they can also take the opportunity to ask questions about how the individual is managing their medication regimen and can alert the GP to potential issues. They can assist with practical aids such as SMS refill reminders and dose-administration aids, and by offering formal medicines reconciliation or patient education services. Similarly, if the GP detects an adherence problem they can enlist the pharmacist's support in ongoing adherence monitoring.[34]

Conclusion

Many patients with type 2 diabetes are not taking their medications as prescribed. By identifying and addressing patient concerns about taking diabetes medication and applying adherence-promoting interventions tailored to the individual needs of the patient and undertaking regular monitoring, GPs can help their patients to obtain maximum benefit from their medications. In the longer term, this will help prevent diabetes complications and translate into better health outcomes. ET

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A list of references is included in the online version of this article (www.endocrinologytoday.com.au).

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