



Opportunities and challenges around non-adherence and self-management in diabetes

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Meet the Experts

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Scott's expertise in the medical, pharmaceutical, and behavioral health fields enables him to provide unique insights into the current market and healthcare environment, ensuring timely and relevant interventions addressing adherence. Dr Guerin works closely with the global health psychology team and assists in conducting research and developing programme strategy and interventions.

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Charles is Director of Partnerships at Atlantis Healthcare enabling collaborative working to deliver patient-centred support programmes. He has consulted to a number of start-up digital healthcare businesses looking to utilise technology as an enabler of delivering better patient outcomes. In November 2013 Charles was appointed Non-Executive Director of Greater Manchester Academic Health Science Network.



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Executive summary

Diabetes is a chronic condition which requires active management from the patient to both medication and lifestyle change. With rates of diabetes on the increase around the world, it is a growing public health issue, especially as non-adherence to positive interventions is common in terms of medication, lifestyle change, monitoring and checks - all with subsequent short and long-term negative health impacts.

Diabetes is also expensive. It is estimated to cost the UK's National Health Service (NHS) £10 billion per year, or 10% of its entire budget.¹ In the US, the estimated cost of diagnosed diabetes was \$245 billion in 2012, including \$176 billion in direct medical costs and \$69 billion in reduced productivity.²

Supporting patients in addressing non-adherence to both medicines and broader self-management principles is therefore critical in reducing the rapid escalation in costs associated with diabetes.

Diabetes mellitus is a major health problem in New Zealand. There are approximately 115 000 people known to have diabetes and an estimated 40 000-60 000 undiagnosed cases.³

The New Zealand Ministry of Health predicts that diabetes rates will increase by 78% in the next ten years. Maori and Pacific Island people are particularly affected. Rates of diabetes are three times more common in these groups and are forecast to rise by 130-150% by 2011 compared with 58% in European people.⁴ Diabetes-related mortality rates are also 10 times higher in Maori and Pacific Island people than in Europeans, and Pacific Island people have higher admission rates to hospital for diabetes than any other ethnic group.⁴ Based on assumptions published by PWC⁵ an increased investment of \$60 million NZD a year in prevention, self-management and early detection services for Type 2 diabetes has the potential to reduce the government's health expenditure by as much as \$370 million in 2021, while at the same time improving the health and wellbeing of New Zealanders.

In this white paper we describe:

- The landscape of non-adherence in diabetes, including levels of adherence and psychological insulin resistance, for both type 1 and type 2 disease.
- Critical reasons why type 1 and type 2 diabetes patients do not adhere to medications and lifestyle changes, including factors relating to physical and mental capability, personal motivation, beliefs about their disease and treatments, plus external factors such as the treatment regimen. These factors form an approach known as (COM-B) model,⁶ applied to adherence by Jackson & colleagues⁷ and which can be successfully used to improve levels of adherence in diabetes. The model ([see box, page 10](#)) embraces aspects to do with Capability, Opportunity and Motivation, which all feed into Behaviour.
- **Collaborative solutions that work in supporting patients in their self-management involving healthcare systems, the pharma industry and patients/carers working together.**

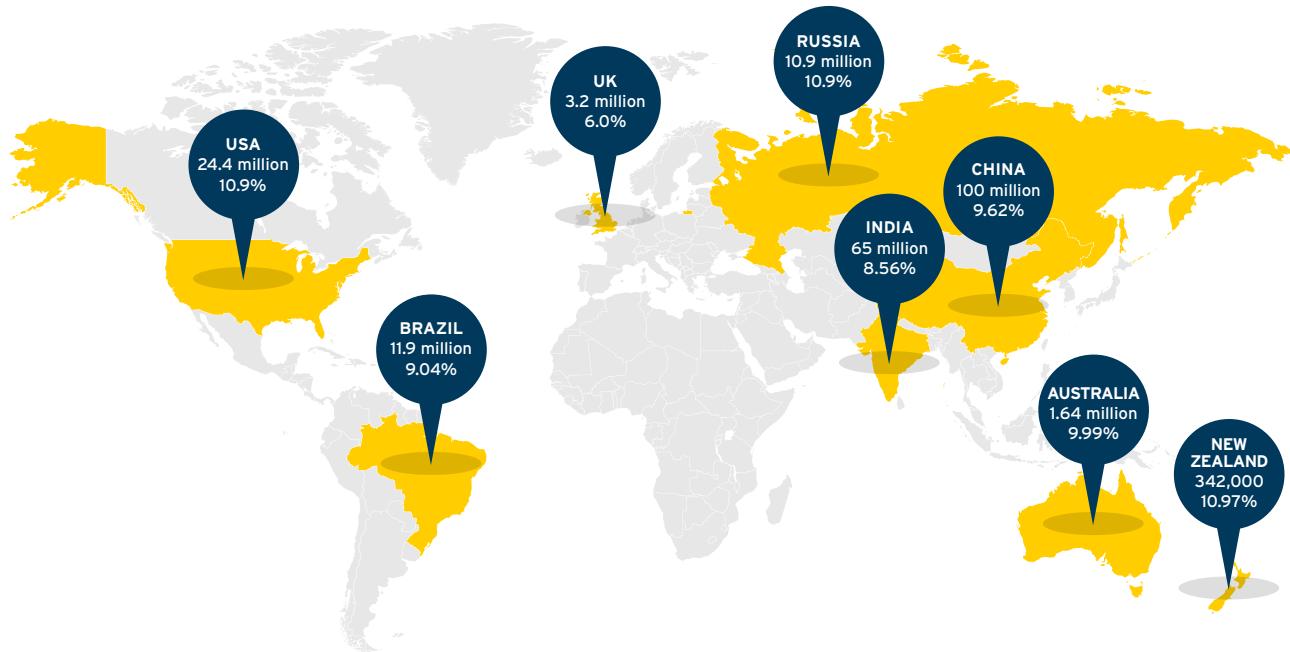
Introduction

Diabetes is characterised by either a lack of insulin produced by the beta cells in the pancreas (type 1) or resistance to the insulin that is produced (type 2), leading to abnormally high levels of glucose in the blood. The complications arising from failure to manage these high blood sugar levels are well documented, including heart / kidney disease, potential blindness from diabetic retinopathy and ulceration / limb amputation as a result of associated neuropathy and poor circulation, all of which have a significant effect on health related quality of life.

At a population level, the disease is one of the biggest challenges faced today, with an estimated global prevalence among adults aged 20-79 of 382 million in 2012, which is expected to rise to 592 million by 2035.⁸ While type 1 diabetes is less common, representing 5-10% of the total, it is estimated that around 175 million people have undiagnosed type 2 diabetes.⁹

Appropriate management of diabetes through both lifestyle change and medication (typically insulin for type 1; and at the initial stages oral hypoglycaemic agents for type 2) is therefore critically important, with good patient adherence to such approaches playing a vital role.

Figure 1: Diabetes prevalence and % population from the International Diabetes Federation:⁹



- China 100 million (9.62%)
- India 65 million (8.56%)
- United States 24.4 million (10.90%)
- Brazil 11.9 million (9.04%)
- Russia 10.9 million (10.9%)
- United Kingdom 3.2 million (6.00%)⁸
- Australia 1.64 million (9.99%)
- New Zealand 342,000 (10.97%)

The language of self-management in diabetes

Self-management in diabetes is the extent to which a person's behaviour corresponds with agreed recommendations from the healthcare provider. This covers taking medication, monitoring blood glucose levels, adopting lifestyle changes and attending regular check-ups. When measuring adherence to medication, a distinction is usually made between fulfilment (whether a prescription is filled) and persistence (whether the patient continues to take their medication as prescribed).

Within diabetes, there are differences in adherence behaviour between patients with type 1 and 2 disease, due to the different causes, perceptions of consequences, treatment regimens and demographics.

Self-management and adherence terminology

- **Initiation** - does the patient actually fill the prescription, having accepted it from the doctor? And do they respond to lifestyle advice?
- **Adherence** - does the patient take the medication as prescribed and adapt their lifestyle to better self-manage their condition?
- **Persistence** - does the patient take the medication and self-manage in the long term?
- **Intensification** - if the patient needs to increase their dose, do they do so, as required or, if they need to go on to insulin from oral drugs, are they willing to do so?

Non-adherence to medicines

There are also different adherence patterns when taking insulin or oral medications, probably because the former is an injectable which may be associated with specific adherence barriers. And some of the different adherence behaviour between type 1 and 2 diabetics can be explained by the greater perception of urgency among the former, for whom failing to take insulin yields immediate, and serious, consequences. Studies in type 2 diabetes consistently illustrate suboptimal levels of adherence, including:

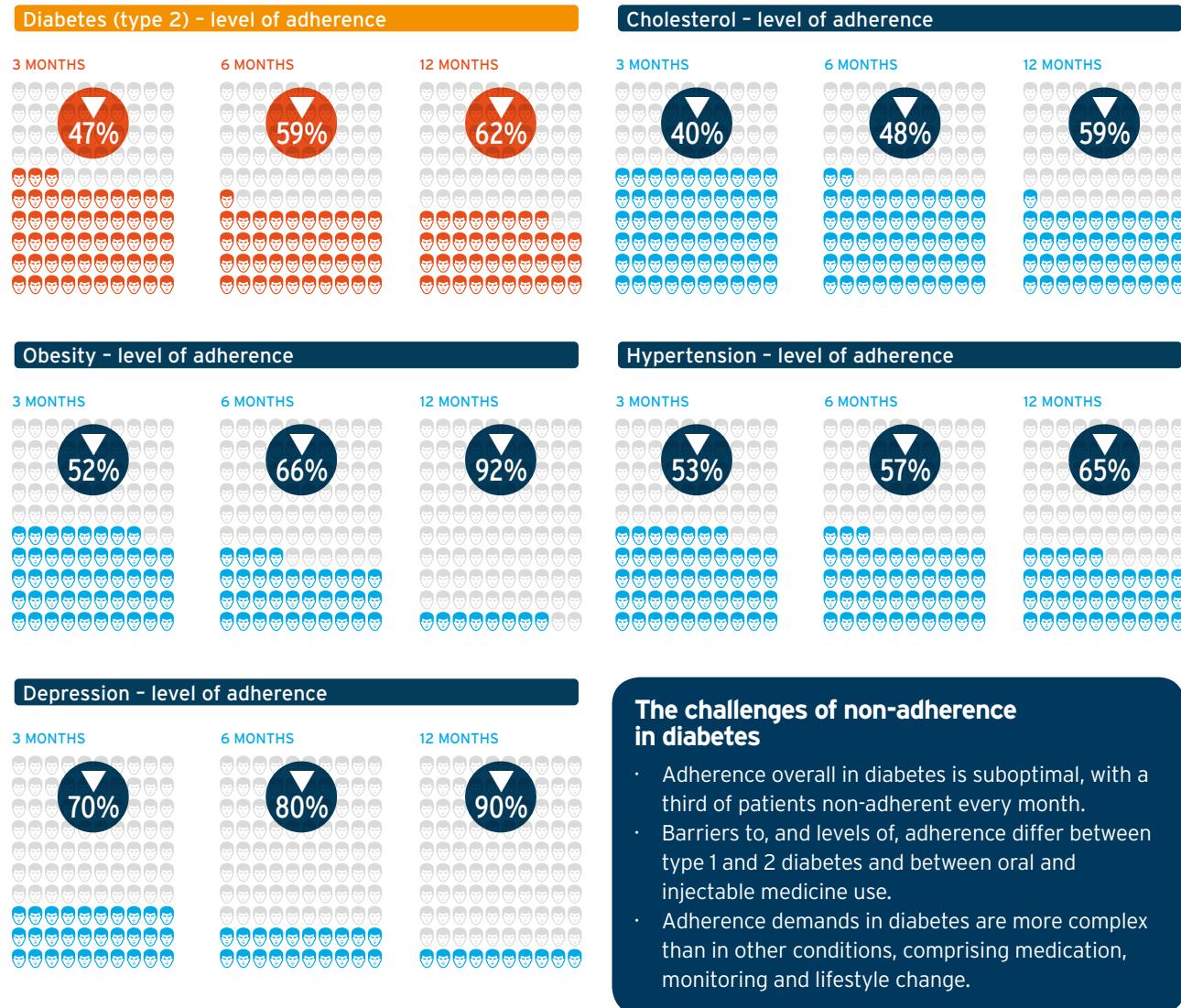
- Only 80% persistence after 24 months in a group of 102 patients newly initiated on insulin during a 10-year follow up study.¹⁰
- Self-reported adherence to insulin generally being in the range of 43% to 86%.¹¹
- A third of patients (33%) saying they had at least one day of non-adherence in the previous month.¹²

Non-adherence to self-management regimens

Adherence rates to lifestyle change requests are even lower than rates of medication adherence.

For dietary change, around one-third of patients are adherent¹³ and this is about the same for blood glucose monitoring.¹⁴ The Diabetes Attitudes, Wishes and Needs (DAWN) study confirms that overall adherence to diabetes regimens is poor, especially when it comes to diet and exercise.¹⁵

FIGURE 2: Adherence rates across a range of chronic conditions, including type 2 diabetes, falls within a few months¹⁶



Diabetes non-adherence: the impact on health & social care systems

For health systems, non-adherence in both type 1 and 2 diabetes can result in increased hospitalisation for episodes of hypoglycaemia and diabetic ketoacidosis. In the longer-term, non-adherence can result in consequences such as lower-limb amputation that are associated with increased healthcare and social costs such as rehabilitation, assistive devices and state benefits, as well as loss of employment and productivity. Diabetes UK, for example, has documented that people with diabetes are twice as likely to be admitted to hospital and that one in seven hospital beds is occupied by someone who has diabetes. In some hospitals, it is as many as 30%.⁸ The American Diabetes Association notes 60% of non-traumatic lower limb amputations in US adults occur in people with diagnosed diabetes.⁸

The social costs, meanwhile, can have a profound impact on an individual and their family, creating an intergenerational impact. And this is additional to the associated costs with caring, where family members may have to give up employment to look after the person with diabetes. The total cost (direct care and indirect costs) associated with diabetes in the UK currently stands at £23.7 billion and is predicted to rise to £39.8 billion by 2035/6.⁸

The evidence for investing in diabetes adherence

There is ample evidence that increased adherence in patients with type 2 diabetes reduces healthcare utilisation and subsequent costs, despite an increase in medication.^{17,18,19} It has been estimated, for example, that improving adherence to medication among currently non-adherent diabetes patients in the US could save \$4.68 billion per year by reducing the number of hospitalisations and emergency department visits.²⁰ Another study showed that when adherence rates are raised from 50% to 100%, the hospitalisation rate was reduced by 23.3% and that of emergency department visits by 46.2%.²¹ However, diabetic drug costs also increased substantially, from \$325 to \$1,105 per person. Yet, for payers, this resulted in savings of \$1.12 in hospital care for every dollar spent on diabetes medications. Cost offsets were increased further when reduced emergency room costs were taken into consideration, resulting in total cost savings of \$1.14 for every additional dollar spent on medications.

Research on the impact of adherence to cardiovascular medicines is also pertinent as many patients with metabolic syndrome (a lead indicator of diabetes) will be taking these. This is important because controlling blood glucose in diabetes only seems to have an effect on microvascular outcomes, like retinopathy, and not macrovascular outcomes.¹⁹ Adherence to blood pressure, triglyceride and cholesterol medications has an effect on macrovascular outcomes - heart disease and stroke - so should be a target in supporting diabetes patients.

For instance, non-adherence to cardio-protective medications, including beta blockers, statins and ACE-inhibitors was associated with a 10% to 40% relative increase in the risk of cardiovascular hospitalisations.

Finally, a rigorous examination of the costs of medicine non-adherence in the US covering patients with congestive heart failure, hypertension, diabetes and dyslipidaemia found that medication adherence at a rate of 100% reduces spending on those with chronic vascular disease,²² mainly through reduced inpatient hospital days and emergency department visits and particularly among those over 65. Furthermore, the additional pharmacy costs associated with adherence are more than offset by the savings made.

Health systems are rising to the non-adherence challenge

The evidence for systemic savings should be more than sufficient to justify investment in self-management programmes that will achieve better adherence to diabetes regimens.

However, health systems have been slow to act, maybe because they have focused predominantly on education programmes, which fail to address the psychological factors that are critical to driving behavioural change. However, financial pressures and other drivers are now prompting a reevaluation.

Adherence initiatives in the US (Scott Guerin)

In the US, there is now a significant effort to increase diabetes control. For instance, in the 2010 Affordable Care Act, a 5-star rating system was developed with a scoring system of 53 performance measures to health plans serving Medicare patients (Medicare Advantage Plans).³⁰ Plans that perform well in managing chronic conditions like diabetes will receive bonuses depending on their scores. One of the scores tracks how well a plan's patients demonstrate adherence to oral diabetes medications.



Adherence initiatives in the UK (Charles MacKinnon)

Improving medicines adherence and reducing associated waste is one of the great challenges facing the NHS. It is also one of the greatest opportunities for improvement to health outcomes.

It is clear that future technological advances and initiatives will change the way patients interact with, and ultimately benefit from, medicines. However this must be built on a strong foundation of evidence and integration into care pathways.



A recently published report from the UK's Royal Pharmaceutical Society entitled 'Medicines Optimisation: Helping patients to make the most of their medicines' recognises that medicines play a crucial role in maintaining health, preventing illness, managing chronic conditions and curing disease and sets out a strategy for improvement.³¹

This strategy has been adopted by a number of the UK's recently formed Academic Health Science Networks (AHSNs) and we should see evidence of medicines optimisation and patient safety improvement leadership filter through to the health and care community. The AHSNs recognise that improvement will be delivered by creating a patient-centred approach with co-ordinated support from multiple sources including collaboration with industry. Keep a watch on the AHSN websites for updates on their activities as their focus will be critical to delivery of medicines optimisation including improved adherence.³²

Diabetes non-adherence: the impact for patients

Patients with type 1 diabetes are aware of the severe and immediate consequences of not taking their insulin. But for all patients non-adherence to medication means, at the very least, that they are putting their long-term health under significant risk and impacting their short-term quality of life through, for example, nocturia (urinating at night), slow wound healing and others, all of which are early warning signals of worse to come.

However, the patient may not always be aware they could feel a lot better with improved control. Instead, they may believe this below-par feeling is the new 'normal'. Fortunately, this is a view that can be challenged, and changed.

The long-term implications of diabetes non-adherence has a significant impact in terms of quality-adjusted life years (QALYs), a key metric for health cost-effectiveness bodies, as not only will life expectancy be shortened but the quality of those remaining years is likely to be impaired. However, frightening patients with these implications is rarely the solution to non-adherence as it often results in the patient engaging in avoidance behaviours.

Moreover, those who suffer adverse consequences are then more likely to have further difficulties in managing their diabetes and adhering to their prescribed regimes. The impact on the family is also likely to be considerable, in both emotional and economic terms, particularly if the person with diabetes experiences a major event like a stroke or loss of sight.

The evidence that adherence drives better outcomes

In patients with type 2 diabetes, treatment adherence has been repeatedly shown to help achieve glycaemic control and improve outcomes. For instance, a study of 4,804 patients with type 2 diabetes on either insulin glargine or insulin detemir found that higher insulin treatment persistence was linked to lower HbA1c (glycated haemoglobin, a marker of blood sugar levels) at follow-up, a greater reduction of HbA1c from baseline and lower healthcare utilisation.²³ Those who persisted for the one-year follow up also had a lower number of healthcare utilisations but with similar overall healthcare costs because of higher pharmacy and medicine costs. There were also significant correlations between the number of treatment-persistent days and the number of hospitalisations.

In another study, covering 11,532 patients with diabetes in a US managed care organisation, patients that were non-adherent to oral hypoglycaemic drugs, anti-hypertensives and statins had higher HbA1c, systolic and diastolic blood pressure and low-density lipoprotein cholesterol levels. The non-adherent patients had higher all-cause hospitalisation (23.2% v 19.2%) and higher all-cause mortality (5.9% v 4.0%)²⁴ versus those adhering to their medicines. Finally, a study of 677 patients on diabetes drugs and/or statins showed that every 10% increase in non-adherence to metformin and statins is associated with a 0.14% increase in HbA1c and a 4.9mg/dl increase in low density lipoprotein cholesterol respectively.²⁵

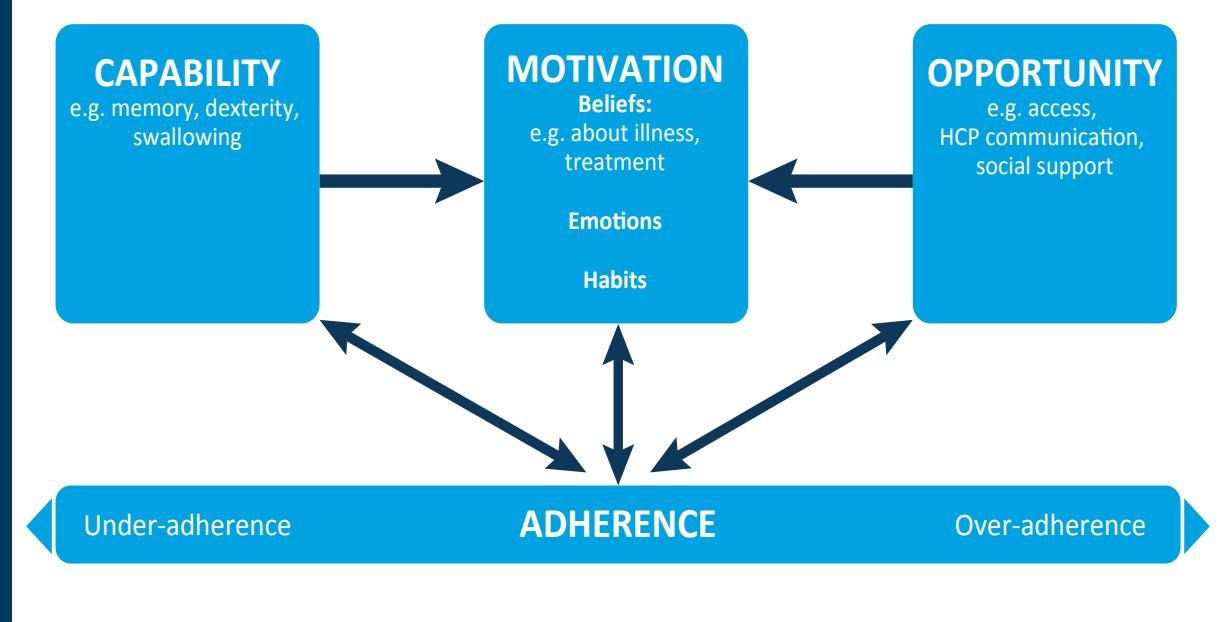
Why don't patients adhere to their diabetes regimen?

The COM-B model for tackling diabetes non-adherence

Health psychology specialists find the COM-B model highly effective in designing programmes which help patients with diabetes improve their adherence to lifestyle change, medication and blood glucose monitoring.⁶ The model classifies the many factors involved in adherence into the following three descriptive groups:

- **CAPABILITY:** The patient's physical and psychological ability to adhere, which covers their understanding of diabetes, the ability to implement the lifestyle and medication regimens.
- **OPPORTUNITY:** Factors that are external to the patient. Includes the quality of social support that a patient experiences, can be particularly relevant for sustaining diet changes.
- **MOTIVATION:** Factors related to the patient's beliefs about diabetes lifestyle changes and treatment, including their perception of the need for dietary changes and importance of blood glucose monitoring. This also includes patients' confidence to manage their condition and their levels of depression or anxiety, so is the category where there is most scope for a health psychology approach.

Why don't patients adhere to medicine?



The benefit of this model is that it allows for interaction between factors. Capability, motivation and opportunity can all have a direct effect on adherence or self-management, but equally capability and opportunity can affect somebody's motivation which impacts their adherence. For example, if you have a limited understanding of your disease and treatment this could impact your perceptions of your need for treatment.

This model is a good starting point when thinking about a patient support programme to identify which factors to address to have the best chance of success. It is important to take into consideration that different factors will be relevant for different people and factors can differ for an individual at different times. These factors can be used to screen patients at the beginning of the programme and content can be tailored based on these factors. So an individual receives content relevant to their particular needs. Understanding why a person isn't adherent is a necessary first step in order to improve adherence.

Understanding the reasons for non-adherence to the diabetes regimen, goes to the heart of the matter and requires an understanding of the many reasons why a patient may not take their medication as prescribed.

Patients often report a perceived stigma associated with injecting, particularly in public places. This is often described as a fear of being mistaken for a drug addict.²⁶ However, people with type 2 diabetes also experience stigma, as the disease has become a prominent public health concern highly linked with lifestyle. This has potential implications for patients' willingness to disclose their illness, monitor and manage their diabetes in public.

In addition, this 'lifestyle blame' towards type 2 patients can lead them to feel guilt, blame and lack of sympathy from others, which again has implications for how they manage their condition. Although social stigma is a factor external to individuals (as a COM-B factor it falls under Opportunity), it is the patient's perception of this stigma that is likely to result in non-adherence as they may anticipate a negative reaction rather than actually experience one. Perceived social stigma is described as an important factor under Motivation according to the COM-B model.

Insights into diabetes non-adherence from the COM-B approach

Atlantis Healthcare applies the COM-B model to understand why patients with type 1 and type 2 diabetes do not adhere to medication. The examples given below demonstrate how different elements of COM-B can impact on different types of adherence, e.g. initiation, missed or delayed dosing, and persistence.²⁷

These examples also show how factors relating specifically to opportunity and motivation do not always impact directly on adherence, but sometimes act indirectly. For example, opportunity factors can affect a patient's motivation, which in turn impacts a patient's adherence. Also, engaging in adherence behaviours which have negative outcomes for the patient can also affect motivation which subsequently will have a further effect on adherence.

Motivation

Patients' perceptions of their diabetes - whether they 'accepted' their condition, or tried to deny it - can impact on their adherence.

In the initial stages following a diagnosis - especially in type 2 diabetes - patients might either be accepting of their diagnosis and commence on therapy or go through a period of denial, where they ignore their diagnosis and consequently do not take their medication. Non-adherence can also be seen if patients' beliefs about their diabetes are fatalistic, as they may feel that their health outcomes are 'in the hands of God', and 'what will be will be'. Over time patients can become fatigued with managing their diabetes and decide to take a 'treatment holiday'.

Patients can delay initiation of insulin therapy if they feel this infers they are losing control over their lives. This sense of loss of control can occur if they have been witness to the later-term consequences or death of a loved one from diabetes.

Patients' beliefs about the efficacy of treatment and their perception of the need for treatment can impact whether they adhere to treatment and continue to take it in the long term. Patients with Type 1 diabetes can be critically aware that insulin is a 'life-saving' drug, and this will prompt them to persist with it over time. Persistence is seen in patients with Type 2 diabetes when they experience the good effects of the medication.

When taking medication becomes an automatic 'habit' for a patient this results in good adherence. This automatic behaviour is formed when patients set a solid routine with their medication, such as pairing their medicine with everyday activities such as brushing their teeth.

Sometimes, patients' experience of adhering to treatment can impact on their motivation, and thus impact their subsequent adherence. Patients new to self-injection may feel apprehensive about using needles and experience 'self-injection anxiety', but most gain confidence with injecting over time. This can be affected if they have a negative experience further down the track. For some patients however, fears are allayed by experiencing the good effects of the medication - shifting their focus from 'end of the road' to 'new beginnings'.

Opportunity

The communication style of the healthcare professional can impact how the patients will ultimately adhere.

Sensitivities in managing lifestyle - particularly respecting cultural foods and ways of eating - are often referred to as critical in diabetes care. If the patient perceived discrimination due to their culture in front of their healthcare professional, then their adherence may be poor.

The above example demonstrates how opportunity factors can directly determine whether an individual will adhere. However, prior experiences can also work indirectly by affecting a patient's motivation, such as beliefs about treatment. The reasons patients deny their diagnosis may sit with prior experience - seeing friends or family members with the disease and being witness to the burden of managing diabetes - not wanting to go down the same road. They may have also witnessed some of the long-term complications of diabetes, and denied their diagnosis in response to the heightened anxiety that accompanied this.

For patients who are injecting insulin, factors external to the patient (opportunity) such as the design of pen equipment could affect their motivation to adhere. Some patients feel that the needles are not portable as they protrude from pockets (particularly an issue for male patients who do not want to carry a bag), and might therefore leave their medication at home or in the car when socialising with their friends. Adherence could be seen as a burden as patients see the need to plan in advance and keep organised with medication.

Effectively tackling diabetes non-adherence

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We have shown that the landscape of adherence in diabetes is complex with each patient having their own specific challenges and barriers. Therefore interventions that only target one factor are unlikely to meet with success. It should also be borne in mind that the support needs of patients with type 1 and 2 diabetes are very different, due to the manner and age at which they received their diagnosis and differences in initial treatment and self-management regimens.

In order to design effective interventions to improve self-management, including adherence, the factors that potentially drive non-adherence, as they are portrayed by the COM-B model, must first be understood. Key factors that are perceived to be highly related to non-adherence or poor self-management can then be specifically targeted in a support solution. Once the target factors are identified, behaviour-change techniques (BCTs) can be used to support the patient in addressing them. These techniques are theory-based methods for changing one or several determinants of behaviour.^{6,27}

Effective interventions ideally include a combination of educational, psychological and behavioural components in order to influence long-term change.

Since diabetes rates are higher in poorer and ethnic populations, any systemic solution needs to also address health inequalities – so they need to be multilingual and address culture-specific requirements, while the cost of suggestions should take into account patients' socioeconomic status.

Finally, the solution must be integrated and complementary to existing clinical care pathways and health IT systems. It must embrace family and social networks, be engaging and add value to the patient. And it should be accessible in a number of ways to support different demographics, e.g. by post, phone, email, SMS, the web and mobile apps.

Whose responsibility is diabetes non-adherence?

Ultimately, the complex challenges leading to, and posed by, non-adherence to diabetes treatment and self-management cannot be addressed by any one group in isolation. Effective solutions are systemic and require various parties to play a role.

1. The pharmaceutical industry

The market for insulin products is highly competitive with a number of new generation insulin offerings as well as biosimilars, such as Eli Lilly and Boehringer Ingelheim's Abrasia, entering the fray.²⁸ Pharmaceutical companies are therefore devising programmes to support patients taking their products. However, companies could also support broader interventions, such as lifestyle changes, if they are to achieve a genuinely positive impact for patients. As real-world outcomes become the measure of value, the case for making more of medicines already on the market becomes stronger, alongside developing new ones.

Assisting patients and prescribers to attain glycaemic control in the long term not only retains patients on treatment but supports successful outcomes. For any marketing group, delivery of real-world outcomes is a powerful message to create a significant point of difference in a crowded market. To achieve this goal support should be delivered to promote adherence to medication and lifestyle changes in a way that aligns with public health priorities. This latter point is important because there has been tension around how some pharma programmes have been based on reaching the highest number of patients, compared to a public health approach of targeting support to those with the highest needs.

Is it the patient's responsibility to be adherent?

Responsibility sits, ultimately, with the patient but there are, of course, broader health system aspects to help the patient implement change. These include everyone who interacts with patients on their journey, such as those concerned with prevention and diabetes education, primary and secondary care, allied healthcare professionals, such as dieticians, payers (both public and private), employers, caregivers, family and friends, as well as pharmaceutical and device companies. All these stakeholders need to align to a common approach, recognising that no single intervention will work to fix all the issues.

While responsibility cannot, and should not, be laid against any one of these groups individually, it may still be useful to describe where some of them could focus their attention, to deliver outcomes recognised by the patient firstly, which will deliver results to each group thereafter.

All providers of devices and pharmaceuticals - not just pharma - should focus on integrating all data collection points available to the patient (FBG meters, smart injection pens, smart blister packs, wearable activity monitors) into a single solution which provides real-time advice on managing their condition - changing dose, monitoring for hypoglycaemia, dietary changes and so forth.

While patient centricity is "marketed" as a key feature of all pharma / device technology providers, these companies still tend to be product focused and must learn to divest some level of control to be able to create an integrated, truly patient-focused solution.

2. Healthcare systems - prescribers and payers

Payers and healthcare professionals both have a role to play in ensuring healthcare systems meet the challenges of patient adherence in diabetes. Currently, patients are not receiving the support they need, with only one person in ten who is newly diagnosed being offered the education they need to manage their condition, despite abundant evidence that it is cost-effective.²⁹

What can healthcare providers do about non-adherence?

Healthcare professionals need to be aware that adherence is suboptimal in their patient group. Often, they do not have the 'adherence conversation' with their patients and thus assume they are adherent. Once it is acknowledged that all patients are at risk of non-adherence and that this can vary over time, healthcare professionals can then see the value of providing adherence support to all patients to equip them with the skills they need to maintain optimal adherence and reduce non-adherence.

However, handling medication adherence is too complex an issue for one healthcare professional alone. Integrated care and multidisciplinary teams, involving nurses, care managers and community pharmacists, are more likely to deliver effective solutions. Meanwhile, realigning payment incentives toward rewarding positive outcomes through adherence to treatment and self management would encourage providers to promote adherence and therefore invest in services to enhance it.

Furthermore, health information technologies, such as electronic health records, prescribing and clinical decision support systems, can ensure complete and accurate medication data are shared among all key players, including patients, prescribing physicians and pharmacists. This would give providers a full picture of the patient's medications and could be linked to reminders and prompts to take them.

Private health insurers have the opportunity to offer incentives for achieving and maintaining long-term glycaemic control, using supporting data from currently available technology and data sources. Public systems should be looking to utilise the same technology supporting patients who are not achieving fasting-blood glucose (FBG) goals in services that can be scaled up for a growing patient population. Healthcare professionals and diabetes educators should be viewed as more of a diabetes 'coach' - helping and guiding the patient over time to optimise their treatment and response to their diabetes challenges.

In short, payers (both private and public) need to change their thinking on diabetes management and look at the incentives for patients in maintaining longer term glycaemic control, using a coaching (self-management model) via healthcare professionals and diabetes educators to support the patient's performance.

3. Patients, their families and carers

The average diabetes patient sees their healthcare provider a few times a year at most. The rest of the time, they manage their diabetes alone, so it is essential that they have the tools, skills and motivation to do so successfully. We need support from advisory groups, patients themselves and carers to help shape the concept, design and content of support programmes to ensure they are relevant, appropriate, effective and suitably engaging.

Making it easier for patients to make better health decisions relating to their diabetes management is the key to better adherence. Technology is not the limiting factor in achieving this, nor is patient education, but instead a holistic focus on addressing the underlying causes of poor self-management. Earlier intervention is also crucial - we should move to impact lifestyle and install self-management skills before diagnosis.

Without input from the patient in the co-design process, no adherence solution can really deliver sustainable benefits.

Conclusion

We have outlined the challenges and opportunities with regards to non-adherence in diabetes. The evidence clearly shows that both type 1 and 2 diabetes patients do not adequately adhere to self-management and medication regimens. Non-adherence has a negative health impact for patients, and cost implications for the healthcare system and the pharmaceutical industry.

From a health psychology point of view, it should be remembered that adherence is multifaceted and includes all aspects of self-management (e.g. medication, blood glucose monitoring, healthy diet and exercise). The reasons for non-adherence are multi-factorial and vary across individuals and over time. These factors can be described in three broad ways, as described by the COM-B model (see box, page 10).

- **Capability**- the patient's physical and mental capability to manage their treatment.
- **Opportunity**- factors outside the individual.
- **Motivation**- all the brain processes that might motivate or affect behaviour.

Modifiable factors that sit under 'motivation' such as patients' beliefs about their illness and treatment are related to non-adherence. Interventions aiming to improve adherence should primarily identify and target patients' motivational factors such as these beliefs, while taking into consideration the capability and opportunity factors that might restrict patients' adherence.

Considering the factors outlined above and how the different players in the healthcare landscape can effectively address this problem, they must:

- **Understand the types of non-adherence, e.g. failing to start treatment, discontinuing treatment, or failing to implement continuously.**
- **Understand the factors behind non-adherence at a personal level, so the groundwork can be laid for a realistic solution.**
- **Adopt tried and tested behavioural change models that go beyond simply educating on the dangers of non-adherence and address, over time, the psychological and motivational factors behind them.**

The solutions exist and the financial and personal benefits to healthcare systems, pharmaceutical industry and patients are clear. It's time to embrace the mutual opportunity in diabetes.

Atlantis Healthcare is a global market leader in the provision of unique patient support solutions and innovative strategies to drive effective adherence and self-management.

For more information on Atlantis Healthcare go to: Web: www.atlantishealthcare.com
LinkedIn: www.linkedin.com/company/atlantis-healthcare Twitter: Follow us @atlantisHtweets

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