

# The Need for a Tool to Assist Health Care Professionals and Patients in Making Medication Treatment Decisions in the Clinical Management of Type 2 Diabetes

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As of the start of 2015, there were 12 classes of drug therapy approved in Europe to treat hyperglycemia in type 2 diabetes, with each class containing multiple medications. Despite this array of medication, adherence and persistence remain poor, with estimates of nonadherence ranging from 7 to 64%, depending on the population and therapy studied (1–3). Poor medication adherence results in the suboptimal clinical benefit of therapy (4), with poor metabolic outcomes, earlier onset and progression of severe microvascular complications, hospitalizations, emergency department visits, and increased mortality associated with lower adherence rates (1,5–7). Nonadherence also poses an immense economic burden on the health care system (6).

One reason for poor adherence to and persistence in taking type 2 diabetes medications may be the continued glucocentric model of diabetes care, in which a steadfast (and at times exclusive) pursuit of optimum A1C levels remains at the forefront of prescribers' minds. However, there is increasing recognition that how patients perceive their condition and associated treatment is an important consideration when making treatment decisions and that achieving optimum A1C levels requires health care professionals (HCPs) and patients to address the clinical and psychosocial aspects of type 2 diabetes together (8,9). Indeed, providing care that is respect-

ful of and responsive to individual patients' preferences, needs, and values and ensuring that patients' values guide all clinical decisions, as well as making treatment decisions using evidence-based guidelines that are tailored to individual patients' preferences, prognoses, and comorbidities, are core principles of evidence-based medicine (8,10).

However, the second Diabetes Attitudes, Wishes and Needs (DAWN2) study found that <50% of patients reported having a health care team who listened to how they would like to do things (UK sample,  $n = 500$ ) (11), despite >80% of the HCP sample indicating that consultation could be improved by patients telling them how they may best support them (12). A shared decision-making approach to treatment choice, in which HCPs and patients act as partners in designing personalized treatment regimens, has shown promise across multiple conditions (13), but in diabetes, we are still "failing our patients by not recognizing that their preferences and views of treatment burden are the most important factor in helping them make glycemic treatment decisions that are best for them" (9).

Patients are willing to act as partners; given the wide array of medications available, most are likely to have some thought about which is most relevant for them and their personalized goals.

Recent meta-analyses have shown that there is little difference among available therapies in terms of glyce-

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mic control (14,15), although they do differ in side-effect profiles (including hypoglycemia, weight effects, and nausea), safety concerns, cost, mode, method, and frequency of administration (9). In addition to cultural and psychosocial variables, these nonglycemic clinical variables may be important drivers of adherence to and (appropriate) persistence with type 2 diabetes medications, through mediating effects on psychological well-being and quality of life. As an example, in a conjoint analysis in Germany, according to the assessed preferences of 827 patients, weight loss is at least as important as the reduction of an elevated A1C (16). In a study eliciting preferences for type 2 diabetes medications, “how you take the medication” was the top reason for picking an oral therapy over an injectable one, despite the injectable therapy being associated with incremental glucose-lowering efficacy (17).

A recent review of the patient preference literature in type 2 diabetes (18) identified that patients’ preferences are based on some individualized function of efficacy variables (e.g., glycemic control, weight loss/control, blood pressure control, life expectancy, and avoidance of complications), treatment burden variables (e.g., method of delivery, mode of administration, flexibility, frequency, intensity, and blood glucose testing requirements), and side-effect variables (e.g., nausea, hypoglycemia, weight gain, and water retention). Indeed, once moderate control of A1C is achieved, patients’ views of the burdens of treatment are perhaps the most important factor in the incremental net benefit of glucose-lowering treatments (9). Perhaps in acknowledgment of this, the 2015 American Diabetes Association (ADA) Standards of Medical Care in Diabetes suggest that considerations to guide choices of pharmacological agents should include efficacy, cost, potential side effects, effects on weight, comorbidities, hypoglycemia risk, and patients’ preferences (10).

To achieve a shared approach to treatment decision-making, HCPs and patients will need decision-support tools that contain quantitative estimates of risk and benefit and are designed to support conversations rather than climb probability trees (9,19). This is particularly true in primary care, where consultation times are short, and, for many HCPs, the choice of type 2 diabetes treatments can be complex and overwhelming (20).

There are numerous generic decision-support tools in existence with various degrees of empirical bases. Few of these address treatment choices, and only one has thus far been developed to support shared decision-making in treatment choices for type 2 diabetes (<http://diabetesdecisionaid.mayoclinic.org>). Although this tool is useful in comparing treatments, it does not include all approved medication classes and offers little beyond existing treatment guidelines. Accordingly, it does not allow for the relative preferences of participants to be understood on one medication attribute versus another, nor does it assist in identifying the medication class of “best fit”—an important objective of such a tool to reduce the overwhelming burden on HCPs (8,20).

A new, time-efficient tool is therefore required to assist HCPs in the identification of medication class “best fit” for individual patients based on their weighted attributional preferences. It is anticipated that this tool would comprise a series of questions relevant to individuals with type 2 diabetes who are considering a therapeutic intensification. Each item should ask patients about their likes and dislikes of therapeutic attributes and the magnitude of their feelings/emotions. The tool should be developed in an electronic format, ideally accessible by web at clinical sites via a handheld or desktop computer. It is anticipated that patients would complete the tool in the waiting area in advance of a consultation. The

hosting program would then contain an algorithm for computing optimal treatment class(es) based on patients’ stated responses (i.e., their relative preferences among the attributes compared to attributes of available therapies) and the difference between patients’ most recent A1C and personalized A1C goal (imputed by the HCP). Patients’ data would be immediately accessible to HCPs on their desktop computer, and information about the optimal treatment class(es) would highlight both short-term (e.g., A1C reduction and risk of hypoglycemia) and long-term (e.g., expected risk reduction in diabetes complications) efficacy based on guidelines of the ADA, the American College of Endocrinology/American Association of Clinical Endocrinologists, and the European Association for the Study of Diabetes (21,22). This information would allow HCPs to target treatment discussions with their patients during the consultation.

In a similar vein to diabetes self-management education programs, where those with a theoretical basis are associated with improved outcomes, using the principles of health psychology and health economic theory to derive the patient-facing items and the attributional algorithm may result in a tool that would enhance provider-patient communication, empower patients, and potentially increase therapeutic adherence and persistence.

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### Duality of Interest

No potential conflicts of interest relevant to this article were reported.

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