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Review

# Clinical inertia and its impact on treatment intensification in people with type 2 diabetes mellitus

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ABSTRACT

Many people with type 2 diabetes mellitus (T2DM) fail to achieve glycaemic control promptly after diagnosis and do not receive timely treatment intensification. This may be in part due to 'clinical inertia', defined as the failure of healthcare providers to initiate or intensify therapy when indicated. Physician-, patient- and healthcare-system-related factors all contribute to clinical inertia. However, decisions that appear to be clinical inertia may, in fact, be only 'apparent' clinical inertia and may reflect good clinical practice on behalf of the physician for a specific patient. Delay in treatment intensification can happen at all stages of treatment for people with T2DM, including prescription of lifestyle changes after diagnosis, introduction of pharmacological therapy, use of combination therapy where needed and initiation of insulin. Clinical inertia may contribute to people with T2DM living with suboptimal glycaemic control for many years, with dramatic consequences for the patient in terms of quality of life, morbidity and mortality, and for public health because of the huge costs associated with uncontrolled T2DM. Because multiple factors can lead to clinical inertia, potential solutions most likely require a combination of approaches involving fundamental changes in medical care. These could include the adoption of a person-centred model of care to account for the complex considerations influencing treatment decisions by patients and physicians. Better patient education about the progressive nature of T2DM and the risks inherent in long-term poor glycaemic control may also reinforce the need for regular treatment reviews, with intensification when required.


## Introduction

Type 2 diabetes mellitus (T2DM) is a progressive disease involving a decline in β-cell function and increase in insulin resistance, meaning that most patients ultimately require intensification of treatment to maintain adequate glycaemic control [1]. Current practice guidelines recommend lifestyle and dietary modifications, usually followed by metformin monotherapy and the further addition of an increasingly complex array of therapies, including oral and injectable medications [2,3]. This treatment algorithm, which includes a recommended delay of 3 months before treatment intensification, has been endorsed by several professional organizations [4,5]. Indeed, patients whose glycaemia is not well controlled, according to guideline targets, may be at increased risk of the long-term micro- and macrovascular complications of diabetes [6–8]. As T2DM progresses, the need for treatment intensification represents a point of transition, where there is a need for good communication between physician and patient, and sufficient understanding by the patient of the goals of therapy to facilitate adherence to treatment [9]. Indeed, it has been reported that patients appear most comfortable with the idea of adding new medicines when they have experienced few problems with their current medications and trust their healthcare provider [10].

However, such times of transition, during which treatment is modified and management becomes more complex, can generate a burden for both physicians and patients. Thus, many patients with poor glycaemic control despite treatment do not receive timely and appropriate intensification of therapy. This failure of physicians to initiate or intensify therapy in a timely manner, despite recognition of the problem, has become known as 'clinical inertia' [11,12]. Failure to initiate or intensify treatment, or taking treatment steps that do not follow evidence-based guidelines, is a frequent phenomenon and is most evident in chronic asymptomatic diseases, although it may influence the management of any

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medical condition [11–13]. As it is known to lead to poor control of the risks for secondary complications of the primary disease, clinical inertia has important implications for the health of individual patients, the public health and overall healthcare expenditures [11,14–16]. While the clinical and economic impact of clinical inertia is still uncertain, it has been implicated in suboptimal management of diabetes, hypertension and lipid disorders, and as a contributing factor in a large proportion of the myocardial infarctions and strokes that arise in patients with such conditions [16,17]. Therefore, specific strategies are required to avoid clinical inertia and patient non-adherence [9,18,19].

Thus, the present review explores the factors that contribute to clinical inertia in the management of T2DM, its impact on patient management and the associated clinical consequences. It also describes strategies for overcoming the obstacles that lead to clinical inertia and the role of education in reducing the impact of clinical inertia on patient care.

## Literature search strategy

In our pragmatic review of the literature, searches were made for the terms 'clinical inertia', 'therapeutic inertia', 'diagnostic inertia' and 'diabetes'. The databases used (limited to publication dates from January 2011 to January 2016) included PubMed, Embase, BIOSIS and SciSearch. In total, 241 references were retrieved, and those included in this review were selected by the authors following a review of the full text and complemented by citations from previous years where appropriate (retrieved from personal collections).

## Definition: is clinical inertia real or apparent?

According to the definition used by Phillips et al. [11], the term 'clinical inertia' may be used interchangeably with 'therapeutic inertia'. In the present review, the term 'clinical inertia' is used throughout [11,14,20]. It has been argued that three conditions must be present for clinical inertia to be identified:

- clinical goals or targets are recognized;
- there is a recommended therapy that can be used to achieve the clinical goals;
- the time frame is appropriate for initiation or intensification of therapy [16,20].

However, standard definitions may not be sufficient to determine whether a decision to modify therapy is appropriate for a given patient. With no additional information of the treating physician's rationale, the clinical results or intermediate steps leading to specific treatment decisions, any therapeutic decision-making that seems to represent clinical inertia may only be 'apparent' clinical inertia and may, in fact, reflect good clinical practice for the specific patient or clinical situation [14,21–23].

Thus, the following strict definition of clinical inertia has been proposed [12]: "Physician behaviour falls under clinical inertia if and only if:

- there is an implicit or explicit guideline;
- the physician is aware of the guideline;
- the physician believes the guideline applies to the patient;
- the physician has the resources to apply the guideline;
- all these conditions have been met, but the physician does not follow the guideline in the case of the patient."

Nevertheless, it has been suggested that clinical inertia may represent a 'clinical safeguard' in some situations, especially if the guidelines do not provide definitive answers for specific patients, although this concept has been challenged [24,25]. Because clinical practice involves inherent uncertainties and complexities when determining the most appropriate course of management for a given patient, it is important to separate true clinical inertia from apparent clinical inertia. Indeed, the importance of individualized treatment targets and strategies, with an emphasis on a patient-centred approach to care, has been included in practice guidelines [3]. Consequently, understanding the factors that underlie true clinical inertia in any specific patient will help to establish how they may be modified so that these barriers to optimal disease control can be overcome [12,15].

## The scale of the problem

### *Clinical inertia can affect all disease stages for people with T2DM*

Many publications relating to management of T2DM focus on delays in initiation of insulin therapy. Indeed, treatment intensification with oral antidiabetic drugs (OADs) is done more frequently than intensification involving the initiation of insulin [26]. However, it is important to recognize that therapeutic delay may be evident at all stages of treatment, including the prescription of lifestyle changes and of metformin at the early stage of prediabetes, initiation of pharmacological therapy after diagnosis, and initiation of combinations of OADs and glucagon-like peptide-1 receptor agonist (GLP-1RA) therapy [26–33].

Several studies have demonstrated clinical inertia at early stages of the disease: in a study involving primary-care physicians in the US, Marrett et al. [28] found that one-third of older people with T2DM, who were not receiving pharmacological therapy at least 6 months after diagnosis, had poor glycaemic control [$HbA_{1c} \geq 7.0\%$ (53 mmol/mol)], with $HbA_{1c}$ levels $\geq 8.0\%$ (64 mmol/mol) in 4% of the cohort. In the same vein, in a study of Spanish primary-care practitioners, clinical inertia affected one-third of those with T2DM and poor glycaemic control [$HbA_{1c} > 7.0\%$ (53 mmol/mol)], and was greater in patients treated with only lifestyle changes or OAD monotherapy than in those receiving more complex therapy [27]. Finally, in a more recent study, Pantalone et al. [34] evaluated intensification of diabetes therapy and $HbA_{1c}$ goal attainment in people with newly diagnosed T2DM when metformin monotherapy failed. Treatment was intensified early (within 6 months of metformin failure) in 62, 69 and 72% of patients with poor glycaemic control, defined as $HbA_{1c} > 7.0\%$ (53 mmol/mol), $> 7.5\%$ (58 mmol/mol) and $> 8.0\%$ (64 mmol/mol), respectively. This had consequences, as the time required for $HbA_{1c}$ goal attainment was shorter in patients who received early treatment intensification [34].

### *Clinical inertia is a frequent phenomenon*

#### *A note of caution in the interpretation of clinical inertia*

Several studies suggest that clinical inertia is a frequent phenomenon, observed sometimes in half of patient–physician encounters. However, as highlighted earlier in this review, it is important to distinguish between real clinical inertia and 'appropriate inaction'. Outcomes from the French DIAttitude Study suggest that clinical inertia in people with T2DM is common in general practice in France. In that retrospective analysis of electronic records from general practitioners (GPs), 41% of patients with two $HbA_{1c}$ values above the recommended threshold still had not had their treatment intensified a year after the second high $HbA_{1c}$ value was recorded [35]. Also, clinical inertia in this study was more frequently observed in older patients and when $HbA_{1c}$ was not particularly high [36,37]. Similarly, another study reported that, for people with newly diagnosed T2DM, the median time to initiation of OAD therapy was significantly longer in those

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