

Minimally Disruptive Medicine for Patients with Diabetes

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Abstract

Purpose of review Patients with diabetes must deal with the burden of symptoms and complications (burden of illness). Simultaneously, diabetes care demands practical and emotional work from patients and their families, work to access and use healthcare and to enact self-care (burden of treatment). Patient work must compete with the demands of family, job, and community life. Overwhelmed patients may not have the capacity to access care or enact self-care and will thus experience suboptimal diabetes outcomes.

Recent findings Minimally disruptive medicine (MDM) is a patient-centered approach to healthcare that prioritizes

patients' goals for life and health while minimizing the healthcare disruption on patients' lives.

Summary In patients with diabetes, particularly in those with complex lives and multimorbidity, MDM coordinates healthcare and community responses to improve outcomes, reduce treatment burden, and enable patients to pursue their life's hopes and dreams.

Keywords Minimally disruptive medicine · Patient-centered care · Burden of treatment · Patient capacity · Diabetes

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Introduction

Diabetes is a global epidemic affecting 422 million adults most living with type 2 diabetes (T2DM) [1]. Diabetes causes substantial morbidity and mortality [2, 3]. Acute diabetes symptoms disturb daily life, while long-term diabetes complications cause suffering and threaten patients' livelihoods and identities [4]. These threats are often met with standardized healthcare and self-care protocols and innovative, albeit costly, therapies. Their impact on patient quality of life and survival is often ascertained indirectly with measures of diabetes control, such as hemoglobin A1c.

Implementing and using complex treatment regimens and participating in frequent interactions with the healthcare system require practical and emotional work from patients and their families in competition with other demands of day-to-day life [5, 6]. Patients must also afford costly treatments and overcome barriers to and inefficiencies in the accessibility and usability of healthcare [6, 7]. In other words, the complexity of living with and managing diabetes extends beyond "people's struggles to endure the symptoms of illness" (burden of illness) and includes the daily work of healthcare patients must enact, and the impact this work may itself have on patient's

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quality of life, i.e., the burden of treatment [8••]. These burdens are exacerbated by the common complication of chronic comorbidity, affecting many patients with long-standing type 1 diabetes (T1DM) and almost all patients with T2DM [9, 10].

Although others have described and researched the distress patients can experience in living with diabetes and other conditions (e.g., cancer) [11, 12], the work patients with diabetes must do and the effect this work has on patient well-being, experienced as burden of care, remain largely understudied in research and unaddressed in practice.

Burden of Treatment in Diabetes

The burden of treatment—its workload and the impact it has on patient well-being—is dynamic. Programs can become burdensome when life routines change or when patients must accommodate modification to stable and well-adapted treatments. Treatment workload may include selecting and counting carbohydrates for meals and snacks, calculating and administering insulin doses several times per day, monitoring glycemia to determine changes in treatment and safety of driving or exercise, and explaining symptoms to family, friends, colleagues, and health professionals [5]. Hypoglycemic episodes, more common with tight glycemic control in patients with advanced diabetes, disrupt daily life and can lead to serious sequelae such as cognitive decline, accidents, and fall-related fractures [13, 14]. Efforts to prevent hypoglycemia, to deal with the anxiety associated with its risk, and to respond and recover from the interruptions it causes likely account for a substantial fraction of the burden of treatment in diabetes [15]. Affording treatment also contributes to the work of patients. In the USA, insulin prices have steadily risen and are prohibitive for some, costing upwards of US\$800/month [7]; health insurance coverage varies across insurers and over time, and patients with high-deductible health plans (e.g., US\$4000/year) and clinics in underserved areas, for example, must do work to access assistance programs and navigate through their associated administrative burdens [16]. Patients must make tough choices to pay for housing and other expenses or to free up resources to face the high out-of-pocket costs and even opt out of routine diabetes care, relying instead on covered acute or emergency care of severe hyperglycemia or of complications [17].

Researchers have estimated that patients adhering to the American Diabetes Association (ADA) recommendations for self-care will have to spend over 2 h daily [5]. Yet, the demands of life—of meeting obligations to self, family, community, and employment—so often laden with meaning, relationships, joy, and well-being—may take priority and displace the enactment of treatment.

Thus, the threat to diabetes is not only limited to the burden of illness but also to the burden of its treatment. Burden of treatment is related to the demands of treatment and the

capacity of the patient to respond to them. Attending to the balance of workload and capacity is therefore central in the management of patients with diabetes [18••]. As healthcare fails to account for the imbalance between the workload and capacity, patients are labeled as “noncompliant” and care becomes ineffective.

The relationship between workload and capacity has been the subject of study only recently, with evolving theories that account for treatment work and capacity [8••, 19]. For example, the cumulative complexity model proposes that the accessibility and the use of care and enactment of self-care depend on having sufficient capacity to shoulder patient work [18••] (Fig. 1). Patient capacity is the available abilities and resources a patient can mobilize to address the demands that healthcare and life make [18••]. It includes not only mental and physical resources but also economic and social support [18••, 19]. Patients overwhelmed by the burden of their illnesses, the management of comorbidities, or the difficult life situations may be unable to shoulder the work required for diabetes management [6•]. When this results in poor outcomes, clinicians—unless they exhibit “medical inertia”—will respond with treatment intensification. This intensification is in part a response to guidelines and quality metrics that, by design, ignore the burden of treatment and context of patients [20]. This added work can further overwhelm patients. A vicious cycle ensues as other aspects of life are ignored in favor of perseverant and narrow attention to healthcare.

Minimally Disruptive Medicine in Diabetes Management

Minimally disruptive medicine (MDM) is a patient-centered approach to healthcare that prioritizes patients’ goals for life and health while minimizing the healthcare disruption on

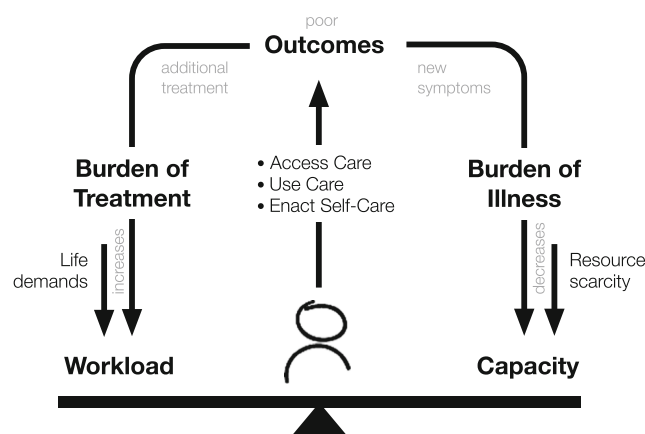


Fig. 1 The cumulative complexity model. This figure depicts the relationship between the balance patient workload and patient capacity, and the patient’s ability to access and use healthcare and to enact self-care in a manner that contributes to health outcomes. It also shows the effect on this balance from (1) the contribution of life demands and scarcity in support and resources and (2) the contribution of burden of illness and of treatment that results from the achieved health outcomes

patients' lives [21••]. MDM has a particularly important role in patients at risk of becoming overwhelmed by treatment: the disadvantaged, the poor, and those with complex medical situations [22•]. These patients may have limited capacity to shoulder the work of accessing, affording, implementing, and routinizing elaborate treatment regimens into daily life.

MDM shares its patient centeredness with other proposals that seek to describe and improve living and dealing with self-care in chronic disease in general [23] and diabetes in particular [24, 25]. These models, however, are focused on the development of self-management skills and patient empowerment. MDM extends these models by focusing attention on patient work and on mitigating the burden caused by this work as a key goal of care design and delivery. MDM must consider all work demands the patient faces from life and from healthcare and the capacity the patient can mobilize to implement this work. It then must adapt treatments to fit the biomedical and personal contexts of each patient arriving at a treatment plan that is compatible with who each patient is and what each patient wants to do in their lives [26]. These regimens must be designed and enacted with focus not only on this compatibility but also on the available capacity patients may have to enact it, lest we overwhelm it placing treatment in competition with life demands and aspirations, so often a losing proposition. Summarizing, MDM seeks to advance patient goals for care while minimizing the burden of treatment.

Tools and Strategies to Implement MDM in Clinical Practice

Although the practice of MDM is only now evolving practical strategies and tools, it is feasible today to assess treatment burden and pivot the orientation of existing medical care to be more aware of the work of patients and to optimize its balance with capacity. Table 1 offers a glossary of terms useful to discuss the role of MDM in practice.

Assessing Treatment Burden

Measures of treatment burden and of workload-capacity imbalance should be used with measures of quality of life, role function, disease control, and ease of access and use of

Table 1 Glossary of key terms

Workload: The demands that patients face in their life, which includes the demands of accessing and using healthcare and enacting self-care. This workload refers to the effort, attention, and time that must be invested in completing such tasks.
Capacity: The available abilities and resources a patient can mobilize to address the demands healthcare and life make.
Burden of treatment: The workload of healthcare and how it impacts patients' functioning and well-being.

healthcare, to configure a quality dashboard for the minimally disruptive treatment of patients with diabetes. Their use could also help benchmark diabetes care across organizations and assist in the monitoring of the quality of care for each patient and trigger MDM responses to mitigate this burden.

Several diabetes-specific measures of treatment burden and related domains (e.g., emotional impact of treatment, monitoring, side effects, diet-related problems, economic burden, etc.) exist, but these ignore comorbidities [27]. To our knowledge, there are two general self-reported measures of treatment burden available for use with patients with any chronic conditions: Patient Experience with Treatment and Self-Management (PETS) measure [22•] and Treatment Burden Questionnaire (TBQ) [28]. Domains include health behavior change, healthcare expenses and services, interpersonal challenges, medical appointments, medical information, medications, mental and physical exhaustion, monitoring health, and role/social activities [29]. While their validity has been established, their responsiveness to effective MDM interventions remains unknown.

Boehmer et al. [19] put forth that patients' capacity is a result of patients' interaction with their biography, resources, environment, life and patient work, and social networks (BREWS). While some of these domains are included in existing tools and have been studied in isolation [30], there is no one instrument to evaluate patient and caregiver capacity, and this deserves attention in future research.

Reducing the Burden of Treatment by Addressing Treatment Workload

Interventions that simplify, consolidate, and synchronize healthcare activities with each other and with patient routines can help reduce workload [8••, 31]. We can learn from interventions that healthcare organizations deploy to reduce waste in the delivery of healthcare services (e.g., lean management and Six Sigma [32]). In the case of MDM, the focus is to apply these processes to reduce the waste patients and caregivers incur as they "consume" healthcare services, freeing up time, attention, and energy for nonhealthcare patient activities. For example, prescription refills could be synchronized and automated, doses packaged together for times of administration, with patient-tailored reminders to trigger dosing or refills, with number of doses, out-of-pocket costs, and administrative procedures (e.g., insurance pre-approval, authorization to switch brands) minimized.

A substantial contributor to treatment burden is the implementation of recommended care for each of the conditions that afflict the multimorbid patient, and therefore, prioritization may reduce the burden of treatment [33]. Current programs of care management already prioritize treatment and self-care tasks, but are usually focused on maximizing the adoption of recommended evidence-based treatments; in an overwhelmed patient with multimorbidity and personal and social complexity, this "total

care” will not be feasible. Seeking efficacy and feasibility requires prioritization, simplification, or deintensification. Because adherence is a complex process of treatment implementation, these changes may improve adherence and reduce the burden of illness thanks to the consistent use of effective treatment, while reducing treatment workload [18••]. Intrinsic characteristics of a treatment, for example, the frequency of dosing (e.g., weekly rather than daily) or the route of administration (e.g., oral rather than parenteral), may affect the effort patients must deploy to use them as directed. Interventions that are easier to use, but are associated with worse side effects or are more expensive, may impose less work but higher burden of treatment. Guidelines need to consider the effect that alternatives can have not just on health outcomes (benefits and harms) but also on treatment workload and burden.

Deintensification of treatment is particularly suited for patients with polypharmacy or at high risk of hypoglycemia [34]. Deintensification and deprescribing can reduce the costs and work of implementing treatments and reduce the risk of adverse events, e.g., hypoglycemia and its consequences in the elderly [14]. Properly designed technologies may also help to reduce the interruptions and consequences of hypoglycemia and improve quality of life, but their user interface may increase treatment complexity—at least initially—and their price tag exacerbates treatment costs [35, 36]. If inexpertly conducted, however, deintensification could unintentionally reduce patient capacity due to the burden of partially treated illness and paradoxically worsen the burden of treatment [18••]. Again, guidelines and quality improvement have built-in disincentives to the prioritization of care, which are just now being recognized [37•]. Yet, guidelines still lack direction on how to consider patients’ multimorbidity, social and personal context, values, preferences, and goals in designing diabetes care for each patient [20, 38]. The practice of MDM requires guidelines that leave room for clinicians to adapt the recommendations to these complex situations, enabling clinician judgment and shared decision making and judging the resulting quality of care based on, among other outcomes, the resulting burden of treatment [39].

Shared decision making, the work that patients and clinicians do together to uncover in conversation the most reasonable course of action, is an ideal context to co-create sensible treatment programs in line with MDM. Tools are available to support specific diabetes-shared decisions [40], including the Statin Choice tool [41] and the Diabetes Medication Choice tool [42]. These tools support conversations about using statins to reduce cardiovascular risk and to determine the most sensible diabetes medication to control hyperglycemia, respectively. Designed to be time-efficient and proven in randomized trials to be effective [40–42], these conversation aids can be deployed to help clinicians and patients prioritize treatments. But these individual treatment decisions must be contextualized given the patient’s attention, time, and energy to

effectively implement treatment within their lives and routines. This coordination of treatment with life demands must be addressed, and the Instrument for Patient Capacity Assessment (ICAN) discussion tool can help [19, 43]. A video demonstration of how an ICAN conversation can support this process is available [44].

In many other instances, MDM may just need to stop burdensome legacy practices that produce unclear or limited benefits to patients. It may suffice, for example, for administrative and medical staff to stop giving patients healthcare errands to run, under the misconception that patients have more time and more “skin in the game” to complete this task than do healthcare professionals. To our knowledge, there is no compelling evidence that transferring such tasks to patients improves health outcomes or the experience of care; conversely, to the extent that they are devoid of meaning to patients, they are frequently described as a source of treatment burden. If administrative barriers persist, governmental and community programs and volunteers could assist patients in securing transportation, in affording and enrolling in health insurance, and in completing other medical errands (e.g., scheduling clinical appointments, obtaining and renewing prescription drugs, paying bills and other paperwork). Innovations focused on reducing the frictions of accessing and using care—such as quick communication using existing consumer platforms (e.g., texting, social media messengers), flexible and direct scheduling, coordination of transportation with visits and pharmacy refills—are fundamental opportunities for technology to support the care of patients at risk of becoming overwhelmed.

Reducing the Burden of Treatment by Addressing Patient Capacity

At the same time as it seeks to optimize patient workload, MDM must deploy tactics that promote patient capacity. The implementation of some of these tactics requires the involvement of heretofore uncoordinated services within and outside healthcare, entities that often work in operational and informational siloes. Indeed, part of patient work is often to bridge these entities. Thus, supporting patient capacity through MDM requires coordination of the healthcare system with the relevant community resources. Community health workers can help patients identify community resources that can be mobilized to support material and financial needs [45, 46].

There are interventions that can bolster patient capacity more broadly. The Chronic Disease Self-Management Program [47], community collaborative systems [48], and resilience training [49, 50] enable patients to develop expertise and confidence in adapt treatments to the dynamic circumstances of their lives. A new form of health coaching, called capacity coaching, guided by the Theory for Patient Capacity [19], seeks to grow patient capacity to successfully self-manage and lead meaningful lives [51, 52]. Additionally, capacity coaches, as well as diabetes educators and clinicians cognizant of patient context, may act

to prompt patients to consider how their social network may support their capacity and help patients troubleshoot through difficult social situations (i.e., injecting in public, work breaks, family meals, etc.) [19].

Furthermore, physical and occupational rehabilitation can optimize function and reduce the effort necessary to complete physical tasks [53]. Medical care of symptomatic comorbidities, mental health, and palliative care can all contribute to enhance capacity by reducing the burden of illness, improving sleep, and reducing fatigue and anxiety [18••, 54, 55]. Table 2 shows some strategies for minimally disruptive diabetes care.

The Path Forward

MDM is a promise that is yet to be tested as a full model of comprehensive diabetes care. Like the Chronic Care Model [56] before, MDM can become an important framework to improve the quality of diabetes care, this time less focused on how to organize healthcare to avoid under treatment and eradicate episodic reactive care of chronic disease and more focused on how to avoid overwhelming patients with regimens that make no intellectual, practical, or emotional sense to patients and clinicians [57]. We expect the MDM framework to be useful in the evaluation of new treatments, new technologies, and new programs of care management. Health apps and closed-loop insulin delivery systems must be designed in a manner that minimizes the investment of patient capacity to learn and routinize their use; technologies should take over tasks previously delegated to the patient.

Clinicians are largely unaware of treatment burden [58], and this can contribute to frustrate their partnership with

Table 2 Some minimally disruptive medicine strategies for patients with diabetes

Determine the burden of treatment
Patient Experience with Treatment and Self-Management (PETS) measure
Treatment Burden Questionnaire (TBQ)
Reduce the burden of treatment by optimizing workload
Deprescribe, deintensify, and simplify (dose, administration) treatments
Prioritize treatments using shared decision making and the ICAN tool
Simplify administrative procedures, including refilling prescriptions
Minimize the delegation to patients of medical errands
Minimizing out-of-pocket costs
Reduce the burden of treatment by enhancing patient capacity
Patient education and training in self-management, resilience
Capacity coaching
Physical and occupational therapy
Palliative care, medical care of comorbidities, including mental health
Social network support
Government and community resources to support material, administrative, and financial needs

patients. Patients with diabetes and the clinicians who care for them may find themselves paralyzed by the complexity of unsuccessful treatment and resort to nihilism. Alternatively, they may staunchly intensify treatments assuming that patients will somehow make the time, money, attention, and energy necessary to implement and routinize this care. MDM stands as a reasonable alternative, a patient-centered response to the situation of cumulative complexity—biological and biographical—in the lives of people who live with diabetes and other chronic conditions.

MDM requires the careful construction of treatment programs, comprised of evidence-based components assembled to aim at each patient's goals, with an eye onto the demands treatment places on patients and caregivers. This attention to workload must extend beyond one's practice and should be coordinated with healthcare and community sources of care and support. Furthermore, it should extend to the administrative structures that support the provision of healthcare and associated policies, which must be redrafted to minimize the delegation of errands to patients and caregivers and navigational complexity. This program must include necessary components to alleviate and palliate the burden of illness, overcome physical limitations through rehabilitation or environmental adaptations, and enhance patient resilience and self-efficacy. This means that minimally disruptive medicine must also be maximally supportive care. With workload optimized and capacity enhanced, patients should be more likely to implement their treatment programs with residual capacity now available for them to pursue their life's hopes and dreams.

Conclusions

As healthcare systems focus on the “triple aim” (better health outcomes, better experience of delivering and receiving care, lower resource use) [59], MDM draws attention to the patient's triple aim: better health, ease of access and use of care, and less burden of treatment. Attention to these outcomes in one's practice, and accountability based on these, may motivate clinicians and patients (and those whose main job is to support them) to work together and drive the kind of improvements in careful and kind care that our patients with diabetes need and demand.

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Author Contributions VS and VMM served as overall principal investigators, conducted the literature review, and wrote and reviewed the manuscript. GSB and KB helped with the literature reviewed, revised the manuscript, and assisted with adaptations. All authors read and approved the final manuscript. VMM is the guarantor of this work.

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Compliance with Ethical Standards

Conflict of Interest Valentina Serrano, Gabriela Spencer-Bonilla, Kasey R. Boehmer, and Victor M. Montori declare that they have no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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