This monthly feature highlights three articles in the current print and online issue of Mayo Clinic Proceedings. These articles are also featured on the Mayo Clinic Proceedings’ YouTube Channel (https://youtu.be/jZjkPgoQTc).

THE ELEPHANT IN THE EXAM ROOM
Physician burnout is both tragic and costly because it vitiates a dream and a career achieved only after years of sustained dedication and accomplishment: superior GPAs and MCAT scores and hours of physician shadowing and community service to secure acceptance into medical school; 4 years of demanding medical school training; 3 or more years in residency; and subsequent years during fellowship and subspecialty training. The fallout from burnout goes beyond the physician so afflicted to envelop patients and patient care, medical centers, and the health care industry; these far-ranging effects of burnout have led to substantial effort to delineate the basis of this malady and ways it can be mitigated. Consistently identified as a salient contributor to burnout is the electronic health record (EHR), ironically, a computerized system introduced, in part, to improve patient care and professional satisfaction of physicians. General attributes of the EHR that may engender burnout include its mechanical engagement that detracts from the direct patient-physician interaction; its ubiquity and tenacity that rarely leave the physician free of administrative obligations requiring completion within a constrained time frame; and its catalytic effect on enabling highways of communication that may not be necessarily relevant to patient care, but, nonetheless, require an expeditious response. The EHR currently requires approximately 2 hours of EHR-related work on personal time after each working day; this denies physicians such personal time that regenerates their sense of vocation and purpose and makes them fresh and ready to embrace a new working day. But what about the intrinsic usability itself of the EHR, in addition to its general attributes, as a cause of burnout? Melnick et al address this question in the present issue of Mayo Clinic Proceedings by cross-sectionally surveying US physicians from all specialties using the American Medical Association Physician Masterfile. Usability of the EHR, broadly considered, was assessed by the System Usability Scale (SUS), a straightforward, reliable, and validated 5-point scale, 10-item questionnaire that evaluates the usability of technologies, products, and services. Burnout was assessed by the Maslach Burnout Inventory, the latter in longstanding use and also reliable and validated. The data demonstrate that while there were substantive differences in EHR usability across specialties and practices, the mean SUS score of the EHR reflected its usability falling into the “not acceptable” range or earning an “F” grade. To put this into context, and as discussed by Melnick et al, this “F” grade places EHR usability way below, for example, Microsoft Excel, which in prior studies of usability of products in common usage, received the least score and graded as “low marginal” in the acceptability range (Melnick et al, Mayo Clinic Proc). Moreover, on multivariate analysis and after adjustments for relevant factors, Melnick et al demonstrate that such poor usability of the EHR...
independently associated with burnout in a dose-dependent manner. While this study is based on an association and thus cannot speak to causality, it seems likely that poor EHR usability contributed to physician burnout, rather than a greater proportion of physicians with burnout evaluating their EHR more harshly; supporting this premise is the fact that EHRs often received better scores from certain specialties more predisposed to burnout. The EHR is a relatively new technology that is here to stay, and as for all new technologies, will likely improve with time. Patients and patient care, physicians, and health care systems deserve an EHR that is far better than one with a failing grade. The importance of the study by Melnick et al is that it uncovers how low in usability the EHR is perceived by physicians, and its dose-response association with physician burnout. The voice of the physician in evaluating the usability of EHRs needs to be heeded in guiding the improvement of this evolving technology.


EXERCISE: AN ANTIHYPERGLYCEMIC AGENT IN THE MANAGEMENT OF TYPE 2 DIABETES

The health benefits of exercise have long been recognized, and, indeed, approximately 2400 years ago, Plato wrote “Lack of activity destroys the good condition of every human being, while movement and methodical physical exercise save it and preserve it.” A vast body of contemporary literature attests to the diverse health benefits of exercise that range from protection against cardiovascular disease to the reduction in the risk for cognitive decline and depression. Yet a sedentary lifestyle continues to markedly increase both nationally and worldwide, and is implicated in the rising global incidence of many chronic conditions, including type 2 diabetes (T2D). In the present issue of Mayo Clinic Proceedings, MacDonald et al examined the effect of exercise on glycemic control in patients with T2D less than 10 years in duration, specifically questioning the extent to which exercise may lessen the need for glucose-lowering medications. This study is a secondary analysis of a randomized controlled trial of exercise in patients with non-insulin dependent T2D. All patients received standard care that involved medical and lifestyle counseling periodically over 12 months, and predetermined algorithms were used to determine the dosing or cessation of glucose-lowering medications; glycemic control involved a target HbA1c of 6.5%. Thirty-one patients received standard care while 61 underwent supervised exercise and dietary guidance, the exercise volumes being divided into tertiles. Exercise and physical activity were monitored by electronic devices, and thus not assessed by the less accurate self-reporting as is commonly employed. The data demonstrate that all tertiles of exercise volumes were associated with an increased likelihood of discontinuing glucose-lowering medications, and for the intermediate and upper tertiles, beneficial effects were observed for cardiovascular risk factors (cardiorespiratory fitness, triglycerides, HbA1c, 2-hour glucose). Such indices, to the extent to which they are either impaired or elevated, may be harbingers of cardiovascular and/or diabetic complications, thereby providing added evidence for the beneficial effects of exercise in T2D. Whether such exercise volumes can be readily incorporated into and sustained in patients' lifestyles is uncertain. However, it should be noted that more recent guidelines for physical activity in adults, as compared with prior guidelines, call for increased activity, and these include either at least 150 to 300 minutes per week of moderate intensity aerobic activity, or 75 to 150 minutes per week of vigorous aerobic activity; alternatively, a proportionate admixture of both types of activity may be followed; additionally, strength training should be undertaken at least twice per week [Piercy et al, JAMA 2018;320(19):2020-2028]. The lower tertiles of exercise volumes in the study by MacDonald et al thus approximate more recent guidelines for physical activity. Notably, exercise is relatively free of charge and adverse
effects whereas glucose-lowering medications impose risks of assorted side effects and costs. MacDonald et al thus demonstrate that exercise may obviate the need for glucose-lowering medication and decrease relevant risk factors in a dose-dependent manner in T2D, and that the second part of Plato’s antithetical statement clearly applies to T2D.


BEARING THE BURDEN OF TREATMENT
Chronic diseases and multimorbidity are increasingly prevalent for at least two reasons. First, the aging of the US and worldwide populations steadily continues, and age is one of the major determinants of chronic diseases. Second, acute diseases, in general, are now more effectively treated, with an attendant reduction in their mortality, thus leaving in the wake of such success the emergence of chronic sequelae of these diseases and their treatment. Multiple strategies and interventions are involved in the management of chronic diseases, which, in their full range, impose on patients what is now described as the burden of treatment. In their seminal analysis more than a decade ago, May, Montori, and Mair defined the burden of treatment as “the work of being a patient,” and called for minimally disruptive medicine as a model that can mitigate such burden and work (BMJ 2009; 339:b2803). In-depth and persuasive analyses, such as for example by Tran et al (BMC Medicine 2015; 13:115), delineated the extent and weight of this burden that include: patient health care responsibilities (education, alterations in lifestyle, non-pharmacologic therapies, medications, follow-up, paperwork); issues that exaggerate the burden of treatment (impaired access to and poor coordination of health care, considerations that are personal, situational, cultural, and financial); and adverse effects of health care responsibilities (nonadherence, undesirable effects on personal and professional life, exacting financial cost). In the present issue of Mayo Clinic Proceedings, Tran et al determined what is an acceptable burden of treatment for patients by evaluating patient responses to the Treatment Burden Questionnaire (TBQ) and by a yes or no answer to the question regarding the sustainability of the current amount of care expended by the patient; the patient population involved the Community of Patients for Research, an e-cohort of patients in France with chronic conditions. The authors adopted the Patient Acceptable Symptom State (PASS) for assessing the burden of treatment; this was defined as the TBQ score under which 75% of patients were accepting of their burden of treatment. Remarkably, 38% of patients with chronic conditions in this survey viewed the burden of their treatment as so daunting that they felt unable to cope with the treatment plan in the long term. Additionally, the authors provide a tool — the PASS for the burden of treatment — that aids in identifying patients who are at risk of not coping with the demands of their medical care. The findings of Tran et al thus advance the field by demonstrating the substantive extent to which patients may regard the burden of their treatment as unendurable in the long term; by introducing a simple index that may identify patients in whom the capacity to cope is increasingly tenuous; and by broadly raising the issue of how the burden of treatment imposed on patients may be modified and/or lessened such that the burden of their illness is more effectively addressed, more readily accommodated, and more serenely borne.