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In the Limelight: December 2022



This month's feature highlights three articles that appear in the current issue of *Mayo Clinic Proceedings*. These articles are also featured on the *Mayo Clinic Proceedings*' YouTube Channel (<https://youtu.be/86yRRW6LlwY>).

**WORSENING BURNOUT DURING THE PANDEMIC: REVERSIBLE OR A NEW BASELINE?**

The consequences of the COVID-19 pandemic have been catastrophic and widespread, leaving untouched very few aspects of our daily lives. In the present issue of *Mayo Clinic Proceedings*, Shanafelt et al assessed the effects of the COVID-19 pandemic on physician burnout by surveying US physicians between December 2021 and January 2022, some 21 months after the beginning of the pandemic. For well over a decade preceding this survey, Shanafelt and colleagues have pioneered the study of physician burnout by recognizing and bringing this lamentable phenomenon to medical and public attention; by elucidating its characteristics, causes, and consequences; and by delineating novel strategies - at the national, organization, work-unit, and individual level - that may reduce the occurrence of burnout and the severity of its impact. In their present study, these investigators drew upon their triennial surveys of physician burnout and satisfaction with work-life integration (WLI) which they began in 2011. Their current survey, involving almost 2500 physicians, revealed that scores for emotional exhaustion and depersonalization markedly increased in the 2021 survey compared with 2020 and

were higher than all of the prior triennial surveys (undertaken in 2020, 2017, 2014, and 2011). For example, compared with the 2020 survey, mean scores for emotional exhaustion and depersonalization in the 2021 survey increased by more than 38% and 60% respectively, while over this time-frame the prevalence of physicians with at least one characteristic of burnout increased by approximately 25%. Satisfaction with WLI in 2021 significantly declined to approximately 30% from 46% in 2020. This marked increase in burnout and decrease in satisfaction with WLI markedly outstripped the increase in depression (6.1%) over this time period, leading the authors to appropriately conclude that the increase in physician distress was work-related. Practitioners in certain specialties - emergency medicine, general pediatrics, and family medicine - and female physicians were at a higher risk for burnout in 2021. Interestingly, a mild mitigation in burnout and an increase in satisfaction in WLI occurred at the overall physician population level in 2020 compared with 2017, which, as suggested by the authors, reflected, in part, a temporary amelioration, during the early days of the pandemic, of some types of stressors that are known to underpin burnout for physicians outside the early pandemic hotspots. However, as the COVID-19 pandemic widely and deeply enveloped the United States and the world, imposing its well-recognized stresses on, and exposing the deficiencies and fissures in, the delivery of health care in the United States, the result was the worsening burnout and the declining satisfaction in WLI as observed in the present



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study. These alarming findings, as underscored by Shanafelt et al, have profound ramifications for US health care. One hopes that these findings do not reflect a new, heightened, essentially unyielding baseline level for physician burnout, but rather a modifiable level that will subside strikingly below its pre-pandemic levels, especially as the pandemic and its attendant burdens abate, and as initiatives to combat burnout prove increasingly effective.

Shanafelt TD, West CP, Dyrbye LN, et al. [Changes in burnout and satisfaction with work-life integration in physicians during the first 2 years of the COVID-19 pandemic.](#) *Mayo Clin Proc.* 2022;97(12):2248-2258. doi.org/10.1016/j.mayocp.2022.09.002

#### URINARY SODIUM-TO-POTASSIUM RATIO AND THE RISK OF INCIDENT CKD

Increased sodium intake has long been linked to hypertension, and, less consistently so, to chronic kidney disease (CKD). Conversely, while hyperkalemia is to be avoided/treated because of its arrhythmogenic effects, there is clear evidence that increased dietary intake of potassium reduces the risk of cardiovascular disease, hypertension, and even CKD. This salutary effect of increased dietary potassium intake may reflect, at least in part, the attendant increase in sodium excretion by the kidney. In addition to assessing the effects of dietary intake of sodium and potassium, independent of each other, in such diseases, an evolving concept emphasizes that the relative dietary intake of each electrolyte, as reflected by the urinary sodium-to-potassium ratio, should also be considered. Using data from the Korean Genome and Epidemiology Study, Joo et al studied whether urinary sodium-to-potassium ratio associates with incident CKD. These investigators determined the urinary sodium-to-potassium ratio in participants with normal kidney function at the time of enrollment between June 1, 2001, and January 31, 2003, and evaluated the occurrence of CKD during follow-up until December 31, 2016. Remarkably, the findings demonstrate that incident CKD was significantly lower in participants whose urinary sodium-to-potassium ratio was in the lowest

tertile compared with those with this ratio in the highest tertile. When the urinary sodium-to-potassium ratio was considered as a continuous variable, as this ratio increased, so did incident CKD. In contrast, there was no significant association with either 24-hour urinary sodium excretion or 24-hour urinary potassium excretion *per se*. To explain these findings, the authors considered whether hypertension was the intermediary between urinary sodium-to-potassium ratio and CKD. However, this appeared unlikely as the association between this ratio and CKD persisted even after adjustment for hypertension, while the prevalence of hypertension was comparable across the three tertiles. Another possible explanation suggested by the authors relates to the previously described association between increased urinary sodium-to-potassium ratio and insulin resistance and between this ratio and obesity. The authors emphasize the need for confirmatory studies, including in other ethnicities. These intriguing findings of Joo et al add to the growing evidence regarding the pathogenetic significance of the relative — and not just absolute — intake of these electrolytes.

Joo YS, Kim HW, Jhee JH, et al. [Urinary sodium-to-potassium ratio and incident chronic kidney disease: results from the Korean Genome and Epidemiology Study.](#) *Mayo Clin Proc.* 2022;97(12):2259-2270. doi.org/10.1016/j.mayocp.2022.04.017

#### DIABETES MELLITUS AND SUDDEN CARDIAC ARREST

To evaluate diabetes mellitus (DM) as a risk factor for sudden cardiac arrest (SCA), Norby et al undertook a prospective community-based study of SCA in 2771 cases and 8313 matched controls, assessing the association of SCA with both type 1 diabetes (T1D) and type 2 diabetes (T2D). Significant differences in the pathogenesis of T1D and T2D exist as well as in the rate at which and the severity with which complications develop in either condition; yet no data are currently available regarding the relative risk of SCA in T1D and T2D. The findings of Norby et al demonstrate that even after adjustment for relevant risk factors, there was a 1.5-fold higher odds for SCA in patients with diabetes, and that the

odds increased approximately 2.5-fold in T1D compared with T2D. The authors point out that while T1D and T2D are associated with various conditions - obesity, hypertension, coronary artery disease, and heart failure - that predispose to SCA, such conditions could not be implicated in the observed differences in T1D and T2D, as their prevalence was similar in both groups. Interestingly, the prevalence of CKD, a condition that itself predisposes to SCA, was greater in T1D compared with either patients with T2D or in those without diabetes, thereby raising the possibility that greater CKD may underlie the higher risk for SCA in T1D. The authors also point out that the similar or increased prevalence of these conditions in patients with T1D, despite their younger age, speaks to the increased tempo with which such conditions/

complications develop in T1D compared with T2D. Furthermore, this study demonstrated that patients with T1D compared with T2D were more likely to have an unwitnessed cardiac arrest, no attempts at resuscitation, and less survival. In addition to underscoring DM as a risk factor for SCA and in uncovering the novel observation that the risk for SCA is greater in patients with T1D compared with T2D, these important findings disclose the relevance of the type of diabetes in strategies that aim to prevent SCA.

Norby FL, Reinier K, Uy-Evanado A, et al. Sudden cardiac death in patients with type 1 versus type 2 diabetes. *Mayo Clin Proc.* 2022;97(12):2271-2281. doi.org/10.1016/j.mayocp.2022.05.021

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