## Potential Impact of Burnout on the US Physician Workforce

***To the Editor:*** The US Department of Health and Human Services projects a shortfall of 45,000 to 90,000 physicians by 2025.[1,2] The magnitude of this shortage may be more acute in specialties such as the primary care disciplines and general surgery.[1] One underrecognized factor that may influence the supply of physicians is professional burnout. Based on a prospective, longitudinal analysis of burnout and payroll records, we recently reported that higher emotional exhaustion (EE) (a dimension of burnout) is associated with an increased likelihood that physicians will reduce their professional work effort.[3] Specifically, each 1-point increase in EE (on a scale of 0-6) was associated with a 43% higher likelihood (odds ratio, 1.43; 95% CI, 1.23-1.67; $P<.001$) of a reduction in professional effort over the next 24 months after adjusting for age, sex, and specialty.[3] Notably, the prevalence of burnout appears to be increasing among US physicians nationally, with the average EE score on this same scale increasing from 3.42 in 2011 to 3.83 in 2014.[4] The potential repercussions of this increase in burnout for the US physician workforce, and whether reducing professional work effort is an effective approach to reduce burnout, are unknown.

We used published data on changes in EE among US physicians[4] along with the data on the relationship between EE and reductions in professional work effort[3] to estimate the potential effect of increased burnout on the physician workforce at the national level. On the basis of these data, the 0.41-point increase in EE in US physicians between 2011 and 2014[4] would be expected to increase the absolute percentage of physicians reducing their professional work effort from 4.0% to 4.7% after adjusting for age, sex, and specialty. With approximately 835,000 physicians in the United States, this would translate into approximately 5929 additional physicians reducing their professional effort due to burnout between 2011 and 2014. Based on the average reduction in professional work effort in our previous publication (18% absolute reduction; SD, 9%; median, 20%),[3] this would equate to a net loss of approximately 1067 physicians (ie, approximately 1.2% of the US physician workforce).

Mayo Clinic surveys its physicians every 12 to 24 months, and we now have follow-up data that allow us to analyze changes in burnout scores among physicians who did or did not reduce their professional work effort.[3] Among the 2231 Mayo Clinic physicians who completed surveys in 2013, 1459 (65.4%) completed surveys in 2015. Mean EE and depersonalization scores improved for physicians who reduced professional work effort relative to those who did not (Table). The EE scores improved in 20 of the 40 physicians who reduced their professional work effort 20 (50%) and worsened in 5 (13%). Among the 1410 physicians who did not reduce professional work effort, EE scores improved in 508 (36%) and worsened in 412 (29%). Similar results were observed for the depersonalization domain of burnout. These

**TABLE. Changes in Burnout Between 2013 and 2015 Based on Whether Physicians Reduced Professional Work Effort**

| Burnout variable | Reduced professional work effort in 12 mo following 2013 survey (n=40) | Did not reduce professional effort (n=1410) | *P* value |
|---|---|---|---|
| Change in emotional exhaustion score[a] | | | |
| Mean change[b] | −0.63 | −.09 | .02[c] |
| Median change[b] | −1 | 0 | .02[d] |
| ≥3-Point improvement | 3 (8%) | 69 (5%) | .02[c] |
| 2-Point improvement | 6 (15%) | 140 (10%) | |
| 1-Point improvement | 11 (28%) | 299 (21%) | |
| No change | 15 (38%) | 490 (35%) | |
| 1-Point worsening | 3 (8%) | 235 (17%) | |
| 2-Point worsening | 2 (5%) | 109 (8%) | |
| ≥3-Point worsening | 0 (0%) | 68 (5%) | |
| Change in depersonalization score[e] | | | |
| Mean change[b] | −0.53 | +0.02 | .02[c] |
| Median change[b] | 0 | 0 | .08[d] |
| ≥3-Point improvement | 4 (10%) | 65 (5%) | .02[c] |
| 2-Point improvement | 5 (13%) | 87 (6%) | |
| 1-Point improvement | 6 (15%) | 209 (15%) | |
| No change | 16 (40%) | 683 (48%) | |
| 1-Point worsening | 8 (20%) | 211 (15%) | |
| 2-Point worsening | 1 (3%) | 82 (6%) | |
| ≥3-Point worsening | 0 (0%) | 73 (5%) | |

[a]Change in emotional exhaustion between 2013 and 2015 surveys (Likert scale, score range 0-6[5]).
[b]Positive values indicate a worsening in score (higher burnout), and negative values indicate an improvement in score (lower burnout).
[c]Change in depersonalization between 2011 and 2013 surveys (Likert scale, score range 0-6[5]).
[d]Analysis of variance.
[e]Mann-Whitney test.

results indicate that reducing work hours is an effective individual strategy to reduce burnout for many physicians.

In summary, the increase in burnout observed in US physicians between 2011 and 2014 likely translated into approximately a 1% reduction in the professional effort of the US physician workforce. This loss is roughly equivalent to eliminating the graduating class of 7 US medical schools.[6] This estimate does not include other potential impacts of burnout on the physician workforce such as early retirement or physicians leaving the profession to pursue nonmedical careers. Reducing professional work effort does appear to be an effective strategy for individual physicians to reduce burnout. Although this approach may help individual physicians, at the societal level it has the potential to exacerbate the pending physician workforce shortage. To preserve adequate access to care, there is a societal imperative to provide physicians a better option than burning out, working part-time, or leaving the profession.

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## Industry Funding of Cancer Patient Advocacy Organizations

***To the Editor:*** Cancer patient advocacy organizations (PAOs) often demand faster drug approval and easier access to cancer medications with uncertain benefits and harms.[1] Previous research has found that a sizable percentage of PAOs across all disease types receive funding from the biopharmaceutical industry[2,3]; as such, the independence of such groups has been questioned.[4]

To our knowledge, however, there has been no research specifically

**TABLE. Patient Advocacy Organizations for Specific Cancer Subtypes Recommended by the National Comprehensive Cancer Center**

| Cancer tumor type | Organization | Biopharmaceutical sponsorship (year) | Pharmaceutical sponsors (No.) |
|---|---|---|---|
| Bladder | Bladder Cancer Advocacy Network | Yes (2014) | 7 |
| Bladder | Urology Care Foundation | Yes | 15 |
| Brain | American Brain Tumor Association | Yes | 1 |
| Brain | National Brain Tumor Society | Not reported | |
| Breast | After Breast Cancer Diagnosis | Not reported | |
| Breast | Breast Cancer Research Foundation | Yes | 4 |
| Breast | Breastcancer.org | Yes | 16 |
| Breast | Facing Our Risk of Cancer Empowered | Yes (2014) | 13 |
| Breast | Inflammatory Breast Cancer Research Foundation | No | |
| Breast | Living Beyond Breast Cancer | Yes (2014) | 15 |
| Breast | Metastatic Breast Cancer Network | Not reported | |
| Breast | National Breast Cancer Coalition | Not reported | |
| Breast | Sisters Network Inc | Yes (2011) | 5 |
| Breast | Susan G. Komen Breast Cancer Foundation | Yes | 5 |
| Breast | Young Survival Coalition | Yes | 4 |
| Carcinoid cancer/neuroendocrine tumors | Carcinoid Cancer Foundation Inc | Yes | 2 |
| Colon | Colon Cancer Alliance | Yes | 4 |
| Colon | Fight Colorectal Cancer | Yes (2014) | 15 |

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