COMMENTARY

Personal Protective Equipment for COVID-19 and Beyond: Occupational and Environmental Exposure Considerations in Primary Care

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Abstract

In this reflection piece, the authors describe a hypertension follow-up visit and draw attention to an often overlooked aspect of a patient’s health: their occupational and environmental history. For years, physicians and clinicians have understood and treated disease secondary to conspicuously harmful environmental exposures; the impacts of everyday exposures on patient health are less understood and appreciated. This article specifically addresses the critical question of how primary care physicians and clinicians can think about, and address, occupational and environmental health hazards in their assessment and treatment of chronic disease in patients. We present 3 strategies that primary care physicians and clinicians can adopt to better account for environmental and occupational risks: good history taking, advising or advocacy, and education.

STEVE, HIS ENVIRONMENT, AND PRIMARY CARE

Steve (name changed to preserve anonymity) is a Black man in his early thirties with no relevant family medical history. He came to our family medicine clinic for a hypertension follow-up visit. He had a history of chronic back pain and was diagnosed with hypertension earlier in the year. At that time, he was started on a single agent and was advised to make lifestyle modifications of which he obliged. He reduced his cigarette consumption from 1 pack per day to an occasional cigarette and began incorporating healthier foods into his diet. During his visit on this particular day, he brought his blood pressure log, which, unfortunately, showed elevated pressures nearly identical to those from his prior visits.

Before diving too deeply into his hypertension, we asked him, much like we do with all of our patients, how he was doing and if he had any other concerns that he wanted to address. After chatting briefly about the most recent sports news, we pivoted to a conversation about his social life. We learned that he had been working at an industrial site as a forklift driver for a couple of years, and his back pain was secondary to a work accident that he experienced not too long ago. During our conversation, we noticed that Steve sounded congested and occasionally coughed. His chart revealed that he was dealing with a long-term cough that, despite multiple evaluations, was still of unknown etiology. Upon further discussion, Steve described that it was not uncommon for boxes filled with industrial agents to explode in his

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face during transportation and lifting. He mentioned that 1 week prior to this visit, 1 of the explosions caused discoloration in his fingers that persisted for nearly 12 hours. Steve also shared that he rarely wore goggles, gloves, industrial grade masks, or other personal protective equipment (PPE) at work. Masks were just now being worn every day because of the COVID-19 pandemic.

At this point, we pivoted from a discussion that was based solely on his hypertension to a conversation that also touched on how his work exposures were likely contributing to his chronic cough and sinus symptoms. We discussed the possible harms related to unknown exposures and the potential risk reduction related to wearing PPE, including gloves, goggles, and an occupation-appropriate mask. Although there was an obvious connection between Steve's back pain and his occupation, a less obvious, but equally important, connection was the potential relationship between Steve's hypertension and his occupational exposures.

To date, cholesterol, diabetes, hypertension, obesity, and smoking are often cited as modifiable cardiovascular risk factors. Often omitted from this list are environmental risk factors, which are increasingly being shown to play a role in the manifestation of cardiovascular disease and a number of other chronic ailments. Research from Yang et al has shown a positive association between ambient air pollution and hypertension. Bellavia et al showed mechanistic evidence that inhaling several air pollutants induces changes in the autonomic nervous system, resulting in endothelial dysfunction and systemic inflammation related to elevated systolic blood pressure. The question then becomes: how might primary care physicians and clinicians think about, and address, occupational and environmental health hazards in their assessment and treatment of chronic disease in patients?

Although occupational and environmental medicine is a board-certified specialty of its own, patients may present to their primary care physicians and clinicians with complaints relevant to environmental and occupational exposures. For years, we have known that occupational exposure to asbestos increases the risk for certain lung cancers. However, patients likely present to their primary care physicians and clinicians with symptoms of weight loss, hemoptysis, and difficulty breathing. Likewise, lead screening remains a regular part of pediatric care in many parts of the country, and, for children with elevated blood lead levels, the American Academy of Pediatrics recommends that physicians and clinicians take a careful environmental history. Hence, it is of utmost importance that family medicine and primary care physicians and clinicians have up-to-date strategies to be sure to address these important etiologies.

GOOD HISTORY TAKING, ESPECIALLY IN PATIENTS MOST AT RISK
The first thing that primary care physicians and clinicians can do to protect patients against environmental and occupational harms is to simply ask questions. Some level of environmental exposure assessment should be included in the history of all patient encounters, but there are patient populations for which these histories are particularly critical. For instance, Steve works in the hand laborers and material movers sector, and, according to the Bureau of Labor Statistics, there were approximately 4.2 million such jobs in 2019. Hand laborers and material movers have some of the highest rates of injuries and illness of all occupations in the United States, and this is often because of the physical exertion associated with the job. The relation between the percentage of those injuries and illnesses and toxin exposure in the workplace is unknown. In addition to carrying substantial physical harms, the compensation of hand laborers is low compared to other workers. In 2019, the recorded median income for hand laborers and material movers was $14.66 per hour (or $30,490 yearly), which falls drastically below the median hourly earnings of all private industry employees ($30.33). Hence, on top of workplace hazards, by virtue of their income, workers in this sector are more likely to experience economic challenges that further compound health outcomes.

Children, the elderly, and those with existing comorbidities also represent populations particularly vulnerable to the effects of environmental exposures. Consequently, picking up on these connections can be meaningful for a substantial segment of the population. Fortunately, environmental exposure histories can often be done in a matter of minutes. The Agency for Toxic Substances and Disease Registry (ATSDR) offers free online course materials for physicians and clinicians who may need assistance implementing environmental exposure history taking in their practice.

ADVISING AND ADVOCACY FOR HEALTH EQUITY
Primary care physicians and clinicians are ideally positioned to intervene and assist patients in protecting themselves from environmental exposures because we establish longitudinal
relationships with patients and are tasked with gaining a comprehensive understanding of a patient’s health and their community. If it becomes apparent that patients are regularly experiencing harmful occupational or environmental exposures, physicians and clinicians have an obligation to recommend strategies that mitigate them and prevent associated illness. This may involve working with social work, contacting company occupational health departments, making referrals to occupational and environmental health specialists, and interacting with other stakeholders to get the patients the care that they require.

It is also important to acknowledge that some exposures cannot be individually modified because of logistics, socioeconomic, or political barriers. It may be unrealistic to ask a patient to move or change jobs, even if these recommendations are aimed at improving their health. This is why advocacy for broader health equity changes has become exceedingly necessary. For a Black man like Steve, there are also important racial health equity considerations. For far too long, clinical medicine has prescribed racial differences in health outcomes to biology rather than societal constructs such as racism. Not surprisingly, environmental racism is one among many manifestations of this injustice. Racial segregation has been associated with increased exposure to air pollutants, among other toxins, with minority communities often bearing disparate burdens of these harms.1–13 Thus, just as physicians and clinicians have done for a number of other social issues, including gun violence and mental health, they should also continue to use their platforms to advocate for policies that can create the systemic changes necessary to mitigate this egregious problem.

EDUCATION AND MEDICAL CURRICULA
Although there may be some exceptions, medical students across the country are not being extensively trained to understand the impact of the environment on a patient’s health. In 2016, the Association of American Medical Colleges reported that approximately one-quarter of medical schools did not require any content related to environmental medicine. Furthermore, among medical schools that did require environmental medicine, students received just 7 hours of training.14 These trends appear to continue into residency education.15 In order to ensure that future generations of physicians and clinicians are well-equipped with the tools necessary to identify and holistically treat the “Steves” who walk into our clinics, environmental and occupational medicine must become larger areas of focus in general and graduate medical education. The American Academy of Family Physicians offers a publicly available occupational medicine curriculum guidelines for family medicine residents.16 The previously mentioned online ATSDR course materials can also be useful for programs and department leadership interested in educating their staff and medical trainees. The ATSDR also provides free adult and pediatric case studies for a number of environmental medicine topics, including lead and environmental triggers of asthma, as well as subjects that may be more obscure to general medicine audiences (eg, polychlorinated biphenyls, nitrates, and trichlorethylene).17

LOOKING FORWARD
Like with many chronic health issues, managing Steve’s hypertension will be ongoing, requiring regular physical examinations and evaluations of his risk factors and treatment progress. It will be the same for other patients presenting with different symptoms or perfect health. Like people, environments are not static, and phenomena such as climate change only contribute to their volatility. Individuals who are privileged to be exposed to minimal workplace hazards and environmental toxins today can find their position changed tomorrow, and vice versa. For instance, the increased prevalence of wildfires and heat waves, such as those found on the western coast of the United States, have been found to negatively impact health outcomes, including the exacerbation of asthma, declines in respiratory function among those without asthma, and an increase in mortality rate.18

The climate crisis means that fewer people will be exempt from exposure to environmental hazards. As arduous as this may sound, there is still a glimmer of hope. Although slow, the passage of domestic health policy has, to an extent, signaled some understanding of the importance of establishing cleaner environments. Take, for example, the paradigm shift that came with public education about the harms of secondhand smoke. A 1995 California law that banned smoking in workplaces (Labor Code 6404.5)19 initiated a wave of smokefree policy adoption across the country.20 After 2 decades, it is rare to encounter a public space where smokefree policies have not been adopted.

Through history taking, advising, advocacy, and education, family medicine physicians and other primary care physicians and clinician have a tremendous opportunity to support broader
structural/policy-based protections and make meaningful environmental and occupational health strides for their patients. Concerns of physician burnout and how asking more might make things harder are equally important. Addressing these concerns, although very complex, should not be a barrier to taking steps that we know are important and necessary for optimizing the health of our patients, especially those who are most vulnerable to environmental and occupational harms.

REFERENCES