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Letters to the editor are considered for publication in the *JAOA* with the understanding that they have not been published elsewhere and that they are not simultaneously under consideration by any other publication.

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## Holding Rhetoric to a New Standard: What's the *P* Value of That Statement, Senator?

*To the Editor:*

"I want to administer an ACE [angiotensin-converting-enzyme] inhibitor for the patient," the medical resident said confidently.

"Ok, we can do that, but what evidence do you have for starting that treatment?" the attending physician countered.

The medical resident responded, "According to the randomized controlled trials CONSENSUS,<sup>1</sup> SOLVD,<sup>2</sup> and SAVE,<sup>3</sup> patients with congestive heart failure and a reduced ejection fraction, when given ACE inhibitors, have a statistically significant decrease

in mortality compared with that of patients not given ACE inhibitors."

This typical exchange between a resident and attending physician in a hospital setting exemplifies how evidence-based practice has become the standard of care in medicine. Treatment practices and recommendations are not made on the basis of opinion, hearsay, or propaganda but on critically reviewed research and statistically robust evidence.

Health care practitioners come to terms with the profound power of bias and its ability to influence ideas and decisions. Although not perfect, health care professionals have found an objective way to make treatment recommendations that address the welfare of patients.

However, a culture of randomized controlled trials and evidence-based practice seems to be of little importance in politics these days. Every day, politicians voice their opinions with little regard to evidence, facts, or statistics. They base their ideas and decisions on deeply rooted beliefs, emotional swings, campaign donor opinions, and propaganda. They speak of war, regulations, taxes, health care, gun control, education, abortion, and environmental issues. There is no talk of type I or II errors, treatment variables, hazard ratios, standard deviations, lead-time biases, or *P* values.

A detractor might protest that medicine is different from politics because in medicine, patient health is at stake. Despite seeming incidental, political statements and laws, I assert, also affect peoples' health. An individual's quality of life, number of hospitalizations, morbidity, and mortality—measures often used in medicine—are measures also affected by political rhetoric and policy. Who is to say whether the decision to go to war, the decision to have no gun-control laws, the decision to cut funding, or the decision to deny universal health care are in fact improving the population's quality of life and decreasing its overall morbidity and mortality? These are matters that need to be studied with empirical research.

Why aren't politicians held to the same rigorous standard as health care practitioners? Why aren't politicians pressed to prove everything they say with hard evidence?

Perhaps one day we will see the following exchange:

Senator: "Ok, I propose XYZ for the country."

Reporter: "Ok we can do that, but what statistical evidence do you have?"

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## Joining Forces: Military Perspectives for Osteopathic Medical Education

*To the Editor:*

I am encouraged by the inclusion of materials from Dr Berkowitz<sup>1</sup> and Dr Murphy<sup>2</sup> in the July issue of *JAOA—The Journal of the American Osteopathic Association*.

Given that less than 1% of the US population is in uniform (according to my calculation of US Census Bureau data<sup>3,4</sup>), and given that relatively few of these individuals have actually deployed into combat, it is clear that unlike in prior conflicts, civilian Americans today stand a very good chance of not knowing any veterans. In my experience, physicians are only marginally more likely to have had known contact with military members, partly as a result of the awareness issues presented in the articles.<sup>1,2</sup>

Confounding this lack of routine contact with members of the military is the nature of US military personnel, who are volunteers, to be compelled to see themselves as willing participants in the defense of the nation and not as conscripted (involuntary) individuals. Therefore, they are less likely to seek care for or discuss issues related to

traumatic brain injury, posttraumatic stress disorder, and other associated military conditions with civilian providers. The “embrace the suck” culture of the volunteer military pushes members to believe that because they signed up for the military, they should not complain when hardships arise. In addition, the stigmatization and stereotyping of the Vietnam veteran as a dysfunctional member of society is a status that contemporary veterans are well aware of and do not wish to be assigned.

To address these issues, we need the cultivation of military academics who can cross the boundary between the military and osteopathic medical education and incorporate experiences and insights into military culture (ie, the warrior mind and barriers to communication) into osteopathic medical students’ educational experiences. Coupled with additional exposure to insights from modern combat into the care of critically wounded patients, such a program could go a long way to avoid the inadvertent stigmatization of veterans while allowing veterans to see that providers are not completely naive about the world of US military service.

My experience as an educator at the Ohio University Heritage College of Osteopathic Medicine has been very positive in this regard. My small group of students has been afforded the opportunity to see a bit of military culture through my experiences as a flight surgeon, as well as to gain a better understanding of the warrior mind. Military physicians cannot help but offer case studies from their personal military experience, and these exchanges reduce ignorance and bridge gaps between the martial and civilian medical worlds.

I would also suggest that it is time for osteopathic medical curriculum planners to start looking at incorporating military and austere medical

concepts into didactic programs. When we consider the serious national debts, natural disasters, and community mass casualty tragedies that we face, such as the kind that occurred in the Colorado theater shooting, we as a profession need to start examining the best practices from the military that are designed to salvage maximum life, limb, and eyesight out of very primitive and limited circumstances. The most “rural” family practice that I have practiced in was about 5 km from Iran in Diyala Province, Iraq. I am now quite comfortable delivering fairly advanced care in very primitive circumstances without the infrastructure taken for granted here in the United States.

The technology and expertise are widely available—what remains is a decided will to implement didactic and hands-on training focused on the delivery of these lifesaving military techniques into the earliest parts of medical education.

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## Giardiasis Revisited: An Underappreciated Reemerging Zoonotic Disease

*To the Editor:*

Presently, the world population exceeds 7 billion humans.<sup>1</sup> Less than

50 years ago, the population barely exceeded 3 billion.<sup>1</sup> People are now living in areas that were previously uninhabited by humans, especially in developing countries. Globally, municipalities are more crowded than ever and basic human needs, such as nutritious food and clean drinking water, are becoming less attainable for many people. This increase in population, along with the increase in globalization and the breakdown of international barriers through travel and trade, has led to an increase in prevalence of several common parasitic diseases, with many of them reemerging in zoonotic contexts.

Management of these diseases has become more difficult because parasites have developed resistance to many of the commonly used treatments such as metronidazole. In the United States, parasitic infections are frequently underdiagnosed or misdiagnosed because health care providers either are unfamiliar with the parasitic infection or because the providers do not have sufficient resources to identify parasitic infection in the laboratory setting. Examples of these undiagnosed cases have been seen in the Department of Microbiology, Infectious and Emerging Diseases laboratory at the Edward Via College of Osteopathic Medicine–Virginia Campus; during the past 18 months, we have identified *Giardia duodenalis* in the stool of 8 osteopathic medical students, all of whom had chronic gastrointestinal infections lasting from 2 to 5 years.

Giardiasis knows no geographic borders or political boundaries. According to a review,<sup>2</sup> the prevalence of giardiasis ranges from 2% to 7% in developed countries to more than 30% in developing countries.<sup>2</sup> Certainly, this is an underestimation—the same review cites recent studies that have reported infection rates surpassing 40% in countries such as Italy and Uganda.<sup>2</sup> In the United States during the past 15 years, giardiasis

has been recognized as one of the most common waterborne and foodborne parasitic diseases in humans and in companion animals such as dogs, cats, rabbits, and horses.<sup>3</sup> During 2011, the number of cases of giardiasis reported to the Centers for Disease Control and Prevention exceeded 20,000.<sup>3</sup> We believe that the actual number of cases is undoubtedly higher, with more cases being misdiagnosed or undiagnosed.

Cases of giardiasis are most likely undiagnosed or misdiagnosed because of a lack of access to proper health care in rural or underserved areas or because of inadequately trained health care providers.<sup>4</sup> It is imperative that health care providers are properly trained to diagnose and manage a disease that is as common as giardiasis. Often, health care providers only associate giardiasis with diarrhea. Yet, other gastrointestinal manifestations of the disease, including nausea, vomiting, dehydration, abdominal cramping, bloating, weight loss, and malabsorption, are often seen in patients with chronic giardiasis.<sup>5,6</sup> Other manifestations unrelated to gastrointestinal symptoms are also seen in patients with chronic giardiasis. These manifestations include itchy skin, hives, periorbital puffiness, and joint effusion. In addition, some studies<sup>5,6</sup> revealed stunting of cognition, stunting of intelligence, and the impeding of psychosocial development in language-cognitive and fine-motor development-affected individuals—disturbing outcomes for patients with chronic giardiasis.

No country or population is immune to endemic giardiasis, although certain groups within a population may be at greater risk for acquiring an infection. These groups include international travelers, backpackers, hikers, and campers who drink unfiltered or untreated water and people who drink from shallow wells.<sup>7</sup> The groups also include chil-

dren who attend day care centers, child care workers, and parents of infected children, especially those who care for children in diapers.<sup>8</sup> People who have contact with animals that have the disease, men who have sex with men, and those who have oral sex are also at a higher risk for the disease.<sup>9,10</sup> All these risk factors must be taken into account by health care workers when developing a differential diagnosis of any patient with related symptoms of giardiasis.

Our understanding of the epidemiology of *Giardia* has changed dramatically during the past decade. This change is because of the presence of different *Giardia* species, strains, and genotypes and their wide and variable host ranges. These changes have made understanding the dynamics of disease transmission difficult for health care workers and research scientists. Understanding *Giardia* epidemiology is particularly important in determining the zoonotic potential of infected domestic animals and in determining the human disease burden attributed to *Giardia* of animal origin. The taxonomy of *Giardia* is complicated: there are 7 known species, including *G duodenalis*. Presently, *G duodenalis* is the only taxonomically recognized species that causes giardiasis in humans and in some mammals.<sup>2</sup> There are many synonyms for *G duodenalis* in the literature. These include *G intestinalis*, *G lamblia*, *Cercomonas intestinalis*, *Lamblia intestinalis*, and *Megastoma enterica*. *G duodenalis* of nonhuman host origin can become infectious to humans. Many common farm animals, such as cattle, pigs, goats, and sheep, can be infected with *G duodenalis*. In addition, many wild animals, including gorillas, reindeer, dolphins, coyotes, harbor seals, and herring gulls, can be infected, making giardiasis one of the most important zoonotic diseases. *G duodenalis* is divided into 8 assemblages, suggesting that *G duodenalis* may represent a multispecies com-

plex.<sup>2</sup> The assemblages are based on phylogenetic analyses of nucleotide sequence of the small-subunit rRNA. The 8 assemblages include the following: assemblage A (humans, non-human primates, and many mammals); assemblage B (humans, nonhuman primates, canines, and cattle); assemblages C and D (canines); assemblage E (domestic ruminants and pigs); assemblage F (cats); assemblage G (rodents); and assemblage H (seals).<sup>2</sup>

Giardiasis has classically been identified from stool samples using standard light microscopy, which remains an important method for diagnosing an infection. Even under ideal conditions, both the trophozoite and cyst stages of *G duodenalis* are difficult to find and to identify and are often missed when examining fresh stool smears or prepared stained slides, especially when the samples contain a low number of parasites.

According to the Centers for Disease Control and Prevention, the use of concentration methods and trichrome staining techniques for processing fecal samples might not be sufficient to identify *G duodenalis*. This may be because of the variability in the concentration of organisms recovered from the stool sample, making

infection difficult to diagnose. For this reason, fecal immunoassays, which are more sensitive and more specific, should be used in conjunction with classical concentration and staining techniques when possible. Rapid immune-chromatographic cartridge assays are also available but should not take the place of routine microscopic ova and parasite examination. Only molecular testing (eg, polymerase chain reaction) can be used to accurately identify the subtypes of *Giardia*, although there are currently many new methods being developed.

Our understanding of giardiasis transmission can be improved through the systematic use of molecular diagnostic tools in well-designed epidemiologic studies conducted in various socioeconomic and geographic settings. The use of molecular diagnostic tools has substantially changed our present understanding of the epidemiology of giardiasis, including its zoonotic impact and global distribution.

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