



# Vox Clamantis

## Workforce Gap Analysis in the Field of Headache Medicine in the United States

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### THE BURDEN OF HEADACHE AND MIGRAINE

Headache is a highly prevalent and disabling neurologic condition.<sup>1</sup> The International Classification of Headache Disorders lists more than 50 types of headache disorders. Among headache types, migraine is responsible for the highest healthcare-related expenditures and causes the most disability. Migraine affects about 47 million people in the US, about 15% of the general population.<sup>1</sup> It is the second most disabling medical condition both in the United States and worldwide, and the most disabling condition among people ages 15-49 worldwide.<sup>1</sup> About one-third of patients presenting to general neurology clinics have a primary complaint of headache, and headache was the fifth most common reason for presentation to the

Emergency Room in 2015 and 2016. It is also a major reason for primary care visits.

Although pain is one component of migraine, migraine is clinically and pathophysiologically distinct from other pain disorders.<sup>2</sup> Migraine is associated with heightened sensation, vertigo, nausea, visual changes, cognitive symptoms, and any of these symptoms may arise without concomitant headache.<sup>2</sup> Although point mutations in nine different genes are linked to significantly heightened susceptibility to migraine, none of these mutations increase the risk of any other pain disorders. The pathophysiology of migraine is better understood and described than that of generalized pain. This pathophysiologic understanding has led to several specific drug targets that have shown efficacy for the acute and preventive treatment of migraine such as

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triptans and calcitonin gene-related peptide (CGRP) inhibiting treatments.<sup>2</sup>

## THE NEED FOR HEADACHE MEDICINE FELLOWSHIPS

Despite the societal burden caused by migraine and its unique clinical features compared to other pain disorders, few physicians receive adequate training to effectively diagnose and treat this disorder. Most medical schools do not have a curriculum in headache medicine.<sup>3</sup> Most of the primary care physicians who provide first line headache evaluation and treatment recommendations never receive formal training in headache medicine. While neurologists are the specialists most likely to care for patients with headache, their training in this field is inadequate.<sup>4</sup>

Mismanagement of migraine and other headache disorders has a significant societal burden. Optimal management of headache disorders is associated with decreased disability, increased work productivity, and improved quality of life for people with headache. Subspecialty training also decreases the use of non-specific treatments for headache pain, such as opioids. Despite evidence that opioids should be avoided for treatment of migraine, 59% of US patients who visit emergency departments due to migraine receive opioids, and 16% of patients with migraine are active opioid users.<sup>5</sup> Thus, increasing the number of fellowship trained headache medicine specialists will likely help to address the ongoing opioid crisis.

There are currently 564 United Council of Neurological Subspecialties (UCNS)-certified headache medicine specialists in the United States.<sup>6</sup> One-third of states have two or fewer headache medicine specialists.<sup>7</sup> The overt disparity between the number of certified headache medicine specialists and the 47 million Americans living with migraine indicates a

vast shortage of headache medicine specialists. Here, we aim to estimate the number of headache specialists needed to provide appropriate care for patients with migraine in the United States. This estimation will help to inform the policy makers, funders, and subspecialty societies in determining the workforce needs.

## ESTIMATION OF HEADACHE MEDICINE WORKFORCE NEEDS

We used available data regarding the migraine prevalence and severity, and headache medicine specialist workload and productivity, to estimate the projected need for headache medicine specialists in the United States. Calculations for three scenarios are presented in Table 1. These scenarios present (1) a conservative estimate of current need; (2) a projected model of need in 20 years assuming stable migraine prevalence; and (3) an optimal access model assuming all patients with significant migraine burden have access to subspecialty care.

Assumptions shared across all models are

- The average headache practice has 3.5 headache specialists (including one Advanced Practice Provider) and sees 140 patients per week (~25% new patients and 75% follow-up) with follow-up visit frequency every 3 months on average.<sup>8</sup> Therefore, each headache specialist can see 480 new patients and 1440 follow-up visits per year (total of 780 patients per year).
- The prevalence of migraine in the United States is 15%.<sup>1</sup>
- 65% of patients with migraine have  $\leq 3$  headache days per month and 35% have  $\geq 4$  headache days per month.<sup>9</sup>
- 20% of migraine patients lapse care in the US each year.<sup>10</sup>

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**Table 1.—Estimated Headache Medicine Specialist Workforce Needs**

	Scenario 1: Current Need	Scenario 2: Projected Need in 2040	Scenario 3: Optimal Access Based on Headache Burden
Migraine frequency	Current: <ul style="list-style-type: none"> <li>• 47 million people currently have migraine</li> <li>• 30.6 million migraine patients have <math>\leq 3</math> headache days per month</li> <li>• 16.5 million migraine patients have <math>\geq 4</math> headache days per month</li> </ul>	Projected in 2040: <ul style="list-style-type: none"> <li>• 57 million people will have migraine (US population 380.2 million, 15% migraine prevalence)</li> <li>• 37 million migraine patients have <math>\leq 3</math> headache days per month</li> <li>• 20 million migraine patients have <math>\geq 4</math> headache days per month</li> </ul>	Current: <ul style="list-style-type: none"> <li>• 47 million people currently have migraine</li> <li>• 30.6 million migraine patients have <math>\leq 3</math> headache days per month</li> <li>• 16.5 million migraine patients have <math>\geq 4</math> headache days per month</li> </ul>
Headache visit utilization	<ul style="list-style-type: none"> <li>• 12% of those with <math>\leq 3</math> headache days per month, and 20.8% of those with <math>\geq 4</math> headache days per month see a health care provider for headache care.<sup>11</sup></li> <li>• Estimated number of patients who currently seek headache care: 5.7 million</li> </ul>	<ul style="list-style-type: none"> <li>• 12% of those with <math>\leq 3</math> headache days per month, and 20.8% of those with <math>\geq 4</math> headache days per month see a health care provider for headache care.<sup>11</sup></li> <li>• Estimated number of patients projected to seek headache care: 6.9 million</li> </ul>	<ul style="list-style-type: none"> <li>• All patients with <math>\geq 4</math> headache days per month are followed by a headache specialist</li> <li>• Headache specialists only see patients with <math>\geq 4</math> headache days per month</li> <li>• Estimated number of patients needing headache care: 16.5 million</li> </ul>
Assuming 50% market penetrance	<ul style="list-style-type: none"> <li>• Estimated number of patients who actually seek Headache clinic care: 2.9 million</li> </ul>	<ul style="list-style-type: none"> <li>• Estimated number of patients who actually seek Headache clinic care: 3.5 million</li> </ul>	<ul style="list-style-type: none"> <li>• Estimated number of patients who actually seek Headache clinic care: 8.3 million</li> </ul>
Estimated number of headache specialists needed in the US (Clinician sees 780 patients per year)	3700	4500	6900

- Trained headache clinicians will work full time and exclusively care for headache patients. We did not account for the geographic distribution of providers nor their full-time vs part-time status nor their retirement nor burnout.

We did not consider the long delay to see a headache medicine specialist for an initial evaluation nor the consequences of this wait on misdiagnosis, mismanagement, and risk of disease “chronification”. We did not include other disabling headache disorders such as post-traumatic headache, trigeminal autonomic cephalalgias, intracranial hypotension, intracranial hypertension. We did not take into account the possibility for increased demand with emerging headache treatment options.

Given the current population, prevalence of migraine, and health care utilization patterns, we

estimate that roughly 3700 headache medicine specialists are currently needed to care for the most affected people with migraine in the United States. We project that 4500 headache medicine specialists will be needed in 2040 due to population growth. If the most severely affected patients with migraine have access to subspecialty care, 6900 headache medicine specialists would be needed to meet this demand. Our workforce estimates project a higher need for headache medicine specialist physicians in the US health care system, than very conservative per capita estimates that have been projected for the European health care market.<sup>12</sup>

## RECOMMENDATIONS

The need for headache medicine specialists is clearly substantial and unmet by the current 564 headache medicine specialists in the US. As described by scenarios 2 and 3, population growth and/or increased

utilization over time will significantly increase the need of headache specialists. In order to begin to meet this demand, we recommend establishment of federal funding of at least 100 headache medicine fellowship slots per year. Although expanding the number of headache medicine fellowship spots to 100 would take more than 20 years to fill the gap calculated with our predictions, we expect that rapid expansion of headache medicine fellowships would have a positive downstream effect on headache medicine knowledge among generalist and other specialty providers.

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