

Primary care providers perform more neurologic visits than neurologists among Medicare beneficiaries

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Abstract

Rationale, aims and objectives: Little is known about which medical providers, other than neurologists, are involved in the care of neurologic conditions. We aimed to describe the current distribution of outpatient neurologic care by provider type.

Methods: We conducted a retrospective, cross-sectional analysis using a 20% national sample claims database that contains information on medical care utilizations from adult Fee-for-Service Medicare beneficiaries in 2015. We identified patient visits for evaluation and management services for common neurologic conditions and by medical provider type. The main outcome was the proportion of visits for neurologic conditions by medical provider type, both in aggregate and across neurologic conditions.

Results: 40% of neurologic visits were performed by primary care providers (PCPs) and 17.5% by neurologists. The most common neurologic conditions were back pain (49.3%), sleep disorders (8.0%), chronic pain/abnormality of gait (6.4%), peripheral neuropathy (5.9%), and stroke (5.5%). Neurologists cared for a large proportion of visits for Parkinson's disease (75.6% vs 20.8%), epilepsy (70.9% vs 26.6%), multiple sclerosis (63.9% vs 26.2%), other central NS disorders (54.2% vs 24.9%), and tremor/RLS/ALS (54.0% vs 31.2%) compared to PCPs. PCPs provided a greater proportion of visits for dizziness/vertigo (57.8% vs 9.3%) and headache/migraine (50.4% vs 35.0%) compared to neurologists.

Conclusions: PCPs perform more neurologic visits than neurologists. With the anticipated increased demand for neurologic care, strategies to optimize neurologic care delivery could consider expanding access to neurologists as well as supporting PCP care for neurologic conditions.

KEYWORDS

access to care, neurologic care, neurologists, primary care

1 | INTRODUCTION

The prevalence of neurologic conditions has increased and is likely to continue to increase over time because of an expanding and ageing population.¹ While neurologists may play a critical role in accurate

diagnosis, treatment and outcomes of some neurologic conditions,^{2,3} many patients with neurologic conditions are not cared for by neurologists.^{2,4,5} Some studies suggested that in conditions, such as dizziness⁵ or Parkinson's disease,² primary care providers (PCPs) may be the ones providing the care. However, outside of these conditions,

little is known about which providers, other than neurologists, are involved in the care of neurologic conditions. In order to plan for the anticipated increase in patients, understanding how neurologic care is currently managed by provider type is important. In this context, we explored the distribution of outpatient neurologic care across medical provider types. Our findings would provide insight for health policy makers to identify the gaps in neurologic care and inform initiatives to optimize the delivery of neurologic care in the United States.

2 | METHODS

We used a 20% sample of 2015 Fee-for-Service Medicare Carrier Files. Visits for neurologic care were defined as office-based new or established patient visits for evaluation and management services (E/M [Current Procedural Terminology codes: 99201-99205, 99241-99245, 99211-99215]) with a neurologic condition as the primary diagnosis. Neurologic conditions were defined by rank ordering neurologic diagnostic categories seen by neurologists (Figure S1). Diagnostic categories were classified using the Clinical Classifications Software (CCS) categories of International Classification of Disease and modified

slightly by the authors to reflect disease categories amongst neurologic sub-specialties (Table S1).⁶ Visits from patients aged <18 or resided outside US or with missing residence were excluded. The unit of analysis for this study was visits. This study used the limited data set and was determined as not regulated by the Institutional Review Board of University of Michigan.

Providers were identified by provider specialty code in the Medicare Carrier Files or healthcare taxonomy codes in the National Provider Identifier files. PCPs were defined as general practise, family practise, and internal medicine specialties. We did not include internal medicine subspecialties (eg, geriatric medicine, endocrinology, pulmonary disease) as PCPs. Since the practise patterns of nurse practitioner and physician assistant in neurologic care were similar to primary care physicians (Figure S2), we included them as PCPs.

2.1 | Statistical analysis

Descriptive statistics were used to summarize visits with a primary neurologic diagnosis cared for by neurologists and other specialties, both in aggregate and across conditions. The proportion of visits cared

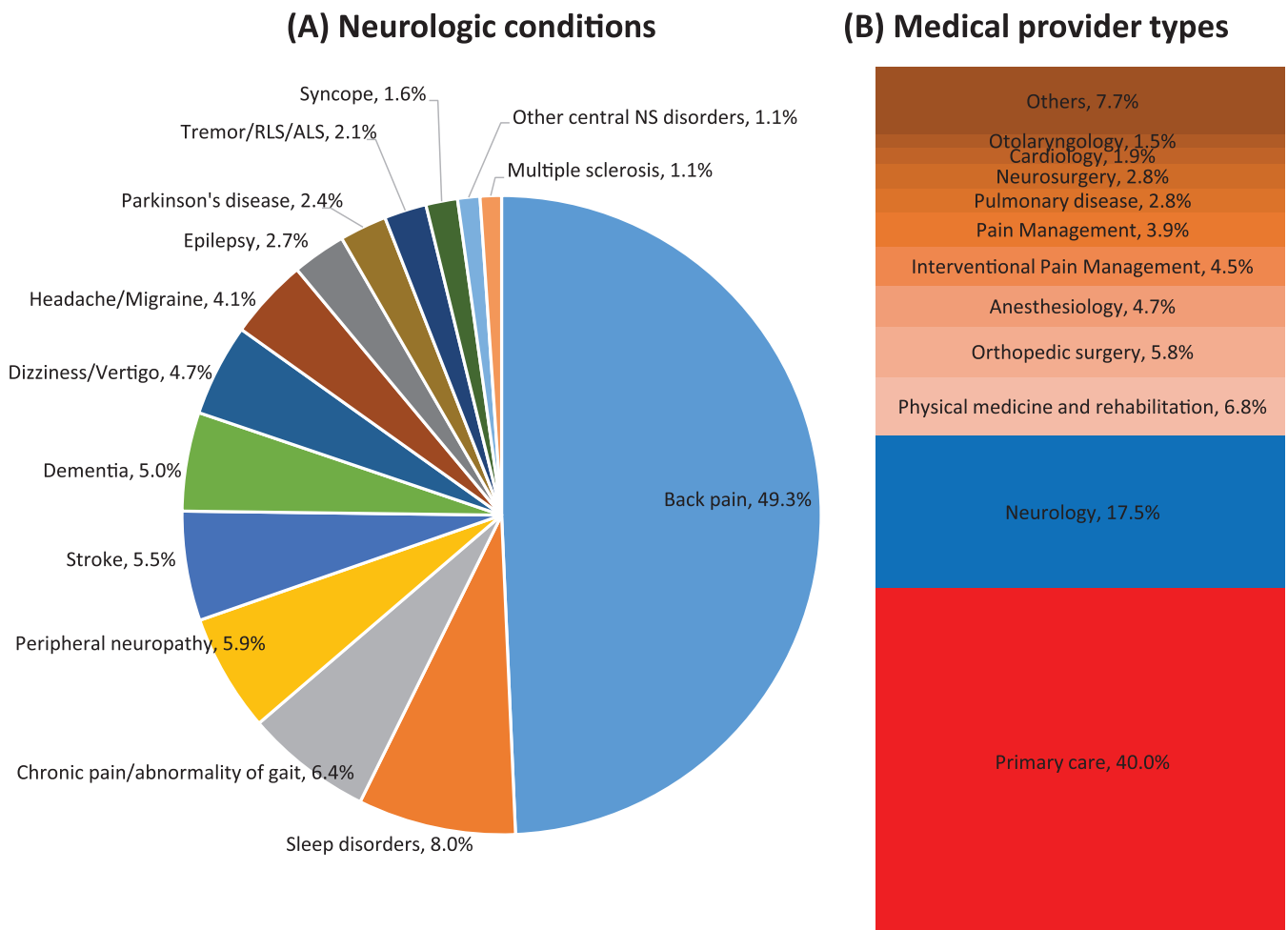


FIGURE 1 The distribution of visits for the most common neurologic conditions. A, Neurologic conditions. B, Medical provider type

by neurologists compared to other specialties were assessed by neurologic condition. Given that some conditions, such as back pain, sleep disorders, dizziness/vertigo, or syncope, might be considered as less specific neurological diagnoses, a sensitivity analysis excluding these conditions were conducted. All statistical analyses were performed using SAS 9.4 (SAS Institute, Cary, NC).

3 | RESULTS

In 2015, there were 33.5 million Fee-for-Service Medicare beneficiaries who had 265 million visits provided by 13627 neurologists, 263772 PCPs and 349021 other clinicians. The average age of beneficiaries was 71 and 17% were under age 65. Visits for the most common neurologic conditions (Figure 1A, Table S2) accounted for 11.5% (30.6 million) of all E/M visits.

Most of neurologic visits were performed by PCPs (40.0% [12.2 million] of neurologic visits) and neurologists (17.5% [5.4 million]) (Figure 1B). Other clinicians, such as physicians with specialties in physical medicine/rehabilitation and orthopaedic surgery, also provided neurologic visits (6.8% and 5.8% of neurologic visits, respectively). Neurologic visits accounted for the majority (85%) of all neurologist visits

(6.3 million visits) while accounting for about 10.5% of all PCP visits (116.7 million visits) and 9.1% of all other clinicians visits (142.4 million visits). Top five most common neurologic conditions were: back pain (49.3%), sleep disorders (8.0%), chronic pain/abnormality of gait (6.4%), peripheral neuropathy (5.9%) and stroke (5.5%). More than one fourth (27.4%) of neurologic visits were for beneficiaries aged <65. The proportion of visits from beneficiaries aged <65 varied by neurologic condition (Figure S3). More than half of visits for multiple sclerosis (66.8%) and epilepsy (57.4%) were for beneficiaries aged <65.

The distribution of neurologic conditions cared for by medical provider type varied greatly (Figure 2). The three most common neurologic conditions cared for by neurologists were dementia (11.8%), epilepsy (11%), and peripheral neuropathy (10.9%) while the top three conditions encountered by PCPs were back pain (49.7%), sleep disorders (8.6%) and chronic pain/abnormality of gait (7.4%).

For some conditions compared to PCPs, neurologists were the dominant providers: Parkinson's disease (75.6% vs 20.8%), epilepsy (70.9% vs 26.6%), multiple sclerosis (63.9% vs 26.2%), other central NS disorders (such as mild cognitive impairment, reflex sympathetic dystrophy) (54.2% vs 24.9%), and tremor/restless legs syndrome/ALS (54.0% vs 31.2%) (Figure 3). PCPs, on the other hand, cared for a

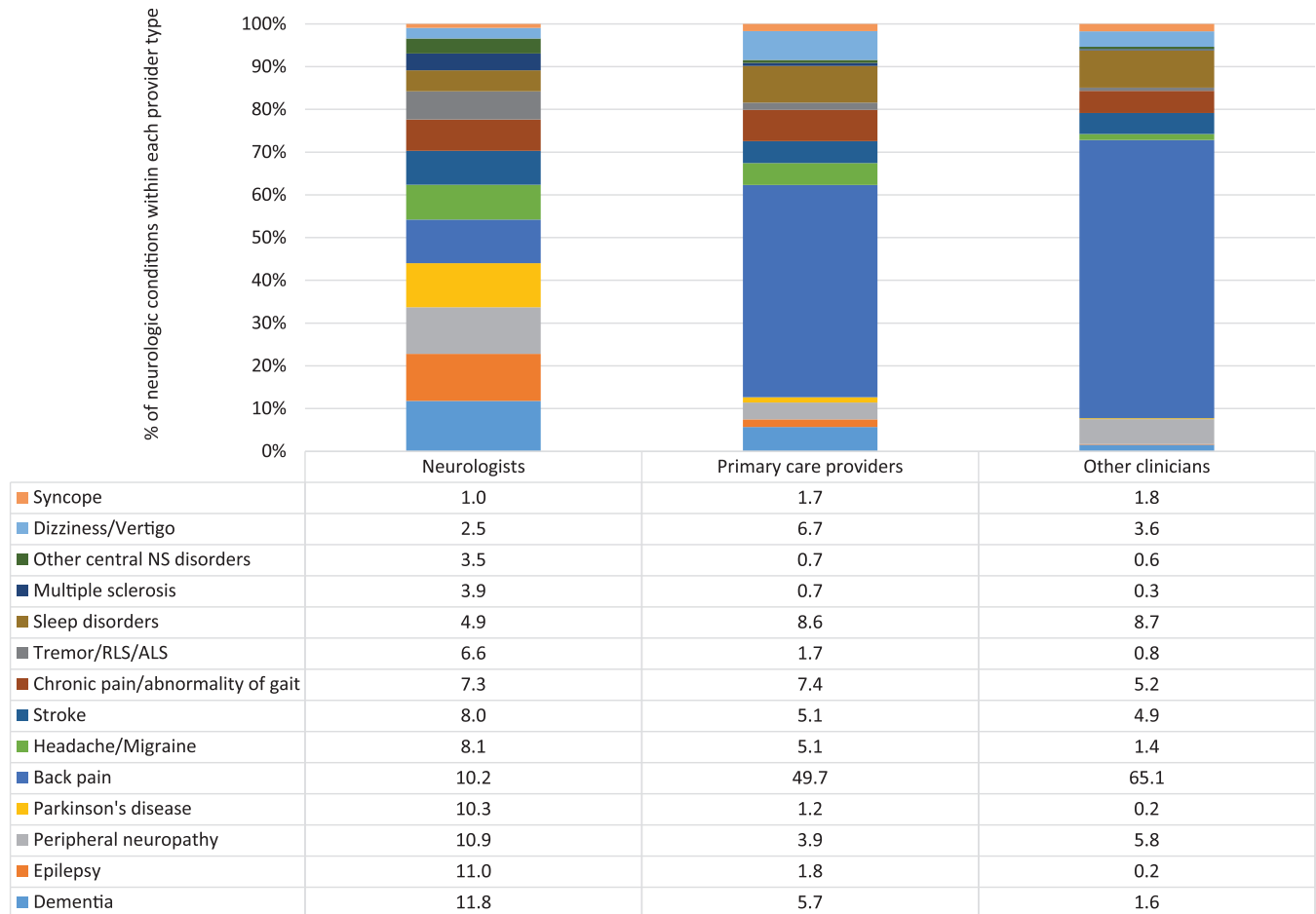


FIGURE 2 The distribution of neurologic conditions cared for by medical provider type

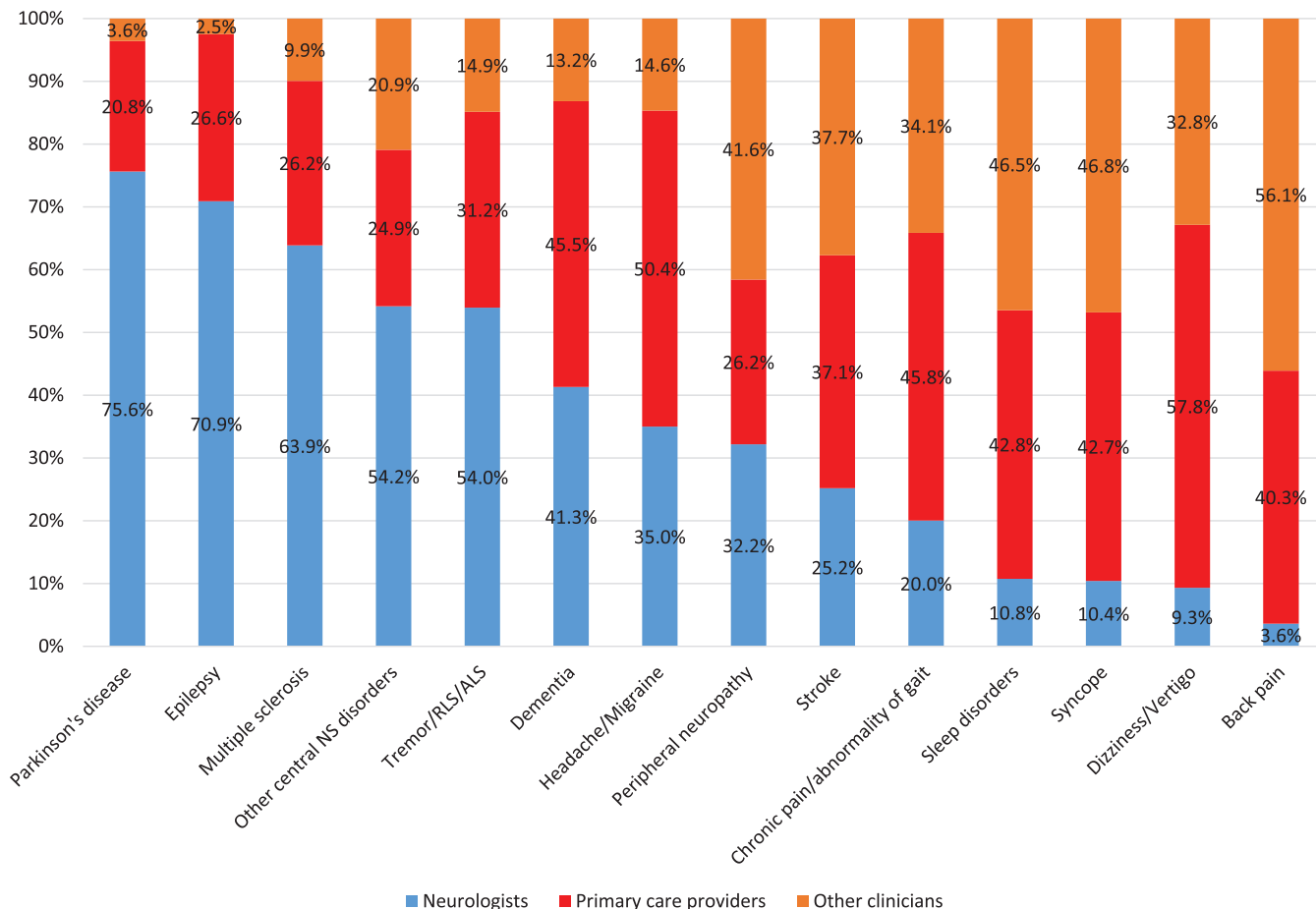


FIGURE 3 The proportion of neurologic visits cared for by medical provider type

greater proportion of visits for dizziness/vertigo (57.8% vs 9.3%) and headache/migraine (50.4% vs 35.0%) compared to neurologists.

In the sensitivity analysis excluding less specific neurological diagnoses, the proportion of neurologic visits provided by neurologists increased from 17.5% to 39.2% while the proportion of neurologic visits provided by PCPs changed little (from 40.0% to 36.6%) (Figure S4).

4 | DISCUSSION

In a nationally representative Medicare sample of adults receiving care for the most common neurologic conditions, PCPs performed 40% of neurologic visits, about 10% of their total visits, while neurologists performed 17.5% of neurologic visits. This is not a surprising finding since PCPs outnumber neurologists 20-fold in the United States. However, neurologic visits by provider type varied by condition. Parkinson's disease, epilepsy, and multiple sclerosis were predominantly (>50% visits) cared for by neurologists while for others, neurologists provided care for <10% of visits.

The provider-based distribution of current neurological care provides some insight into how best to prepare for the anticipated increase in patients with neurologic conditions. In the near term,

strategies to optimize neurologic care delivery likely depend on whether the neurologic condition is predominately neurologist-managed, whereby strategies to expand access to neurologists may be reasonable, or predominately PCP-managed, whereby supporting PCP care could be considered. For conditions that are predominately neurologist-managed, strategies to accommodate growth in these conditions may focus on expanding access to neurologists, including increasing neurology residency programmes, telehealth and shared care models. Telehealth, best developed for the assessment of stroke, has recently been used with multiple sclerosis⁷ and Parkinson's disease.⁸ Shared care models, in which neurologists and PCPs share responsibility for a patient's care, are successful in chronic medical conditions and are expanding to neurologic conditions.⁹

For conditions that are predominantly primary care-managed, strategies could focus on supporting PCP care via physician clinical decision support, increasing of neurology exposure during residency,¹⁰ or developing patient self-management tools,¹¹ could be considered. Thoughtful attention to physician training focused on development of a basic proficiency in recognition and referral of complex neurologic conditions would increase the current workforce capacity.

How to best utilise the limited pool of neurologists is complex and requires an understanding of the value of neurologic care. Across

neurologic conditions and varying patient presentations, some visits with neurologists likely have very high value (eg, improved functioning³), whereas others are low value (eg, increased costs without established outcome benefit¹²). For optimal patient care and to specifically evaluate the value of neurologic care, future studies should be performed to understand the reasons underlying current practise patterns and test the effect of different models of neurologic care delivery on patient-centred outcomes. One approach would be to examine the association of neurologist density with geographic variation the neurologic care and outcomes.

Our study has several limitations. First, our results are limited to adults with Fee-for-service Medicare and cannot be generalized to all Americans, particularly the working age population. Second, while accuracy of coding for neurologic conditions is reasonable, coding inaccuracy may still exist; physician specialties may be miscoded. Third, only the primary diagnosis of each E/M visit was used and thus neurologic diagnoses may be underestimated. Fourth, we cannot use claims to know the role providers played in patients' neurologic care (eg, as a referral, follow-up, or a primary provider). Further study of the relationship between PCPs and neurologists is needed.

5 | CONCLUSIONS

PCPs perform more neurologic visits than neurologists overall, but there is substantial variation by condition. With the anticipated increased demand for neurologic care, strategies to optimize neurologic care delivery should consider expanding access to neurologists as well as supporting PCPs care for neurologic conditions. To better inform innovative strategies, future studies should explore neurologist and PCP focused interventions and their effect on patient outcomes.

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CONFLICT OF INTEREST

Dr. Callaghan consults for a PCORI grant, DynaMed, the Immune Tolerance Network, and performs medical legal consultations including consultations for the Vaccine Injury Compensation Program. Drs. Lin, Burke, Kerber, Skolarus, Hill, Hartley report no disclosures.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of this article.

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