

## Brief Communication

# The Role of the Neurological Examination in Primary Care Referrals to Neurology

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**ABSTRACT:** Low confidence with the neurological examination may contribute to primary care physicians' discomfort with neurology and a low threshold to refer patients. We surveyed primary care physicians in Quebec about their last three referrals to neurology to evaluate what role the neurological examination played in their decision. Twenty-six physicians answered concerning 73 patient referrals. We found that primary care physicians use the neurological examination to reinforce their decision but rarely depend on the findings. Our results suggest that improving history-taking rather than examination skills may have more impact on neurology referrals, influencing quality of referral information above quantity of referrals.

**RÉSUMÉ :** Le rôle de l'examen neurologique dans l'orientation de patients vers un neurologue par des médecins de première ligne. Une faible confiance à l'égard des examens neurologiques peut contribuer au « malaise » des médecins de première ligne à l'égard de la neurologie ainsi qu'à un faible taux d'orientation de leurs patients vers un neurologue. À ce sujet, nous avons interrogé des médecins de première ligne du Québec en ce qui regarde leurs trois dernières orientations en neurologie afin d'évaluer le rôle joué par l'examen neurologique dans leur décision. Au total, 26 médecins ont répondu, ce qui a représenté 73 patients orientés. Nous avons ainsi constaté que les médecins de première ligne utilisent certes l'examen neurologique pour renforcer leur décision mais qu'ils se fient rarement à ses résultats. Nos résultats suggèrent donc que l'amélioration des compétences en matière de vérification des antécédents médicaux (*history-taking*) et non le fait de réaliser un examen neurologique pourrait avoir plus d'impact sur l'orientation vers un neurologue en influençant la qualité de l'information liée à ces orientations plutôt que la quantité des patients aiguillés.

**Keywords:** Neurological examination; Neurology – education; General neurology; Communication

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Considering the long delays to access outpatient neurological care across Canada (e.g., see Liddy et al.<sup>1</sup>), one strategy to ease wait times would be to reduce the number of referrals from primary care to neurology. Although accounting for 10–15% of problems encountered in their practice, Neurology is one area of medicine with which primary care physicians often report being less comfortable.<sup>2–3</sup> This can lead to the referral of patients not for a specific diagnosis or treatment but rather for symptoms.<sup>4</sup> Although over-referral may not be an issue,<sup>5</sup> more precise clinical impressions and referral information could improve triaging and reduce wait times for patients who need to be prioritized for neurological assessment.

We were interested in exploring how primary care physicians use the neurological examination when assessing patients with neurological symptoms, since some evidence suggests that low confidence with performing and interpreting this examination contributes to their reported discomfort with neurology.<sup>6</sup> The aim of our study was to examine what role the neurological

examination plays in primary care physicians' decision to refer. We conducted a cross-sectional survey of board-certified primary care physicians affiliated with McGill University or University of Montreal. We asked participants about the last three patients they referred to neurology and the role the neurological examination played in the decision to refer (survey available in Supplemental materials).

Twenty-six family physicians answered the survey (demographic information available in Supplemental materials). In the 90 days prior to completing the survey, the majority of participants (19/26 [73%]) had referred 1 or 2 patients to neurology, 4 (15%) had referred 3–5 patients and 3 (12%) had not referred any within those 90 days (the rest of the survey asked about the last 3 patients referred, regardless of the timing). Only 4 participants, who together accounted for 12 patient referrals, had received formal post-graduate training in Neurology (a neurology rotation or direct training with a neurologist).

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Participants reported on a total of 73 referrals. In 31 (43%) of these encounters, the primary care physician performed a full neurological examination, in 37 (50%) they performed a partial examination, and in 5 (7%) a neurological examination was not done or was done by a trainee. Twenty-eight of the 73 referrals (38%) had an abnormal exam. The survey asked whether the results of the neurological examination influenced the primary care physician's decision to refer the patient. The exam findings (positive or negative) did influence the decision to refer the patient in 38% (28/73) of patients; however, the findings *changed* the family physician's mind to refer the patient in only 5% (4/73). Concerning the single main reason for the referral, the presenting symptom was the most commonly reported reason in 42% (31/73) of cases; abnormal findings on the neurological examination were the main reason for referral in 30% (22/73).

Among the four participants who had previously received formal training in Neurology, there was a tendency to more often detect abnormal findings on examination (7/12 [58%] versus 21/56 [38%]) and to more often report that the examination influenced their decision to refer (7/12 [58%] versus 21/61 [34%]).

Twenty-seven referrals (37%) provided the presenting symptoms for which the diagnosis was unclear, 25 referrals (34%) provided a specific diagnosis, 19 (26%) provided neurological examination findings, and 18 (25%) provided a few differential diagnoses. The detection of abnormal findings influenced the information provided on the referral. Forty-six percent (13/28) of patients with an abnormal neurological examination were referred with a specific diagnosis versus 25% (10/40) of patients with a normal examination; 50% (14/28) of patients with abnormal examinations were referred with examination finding information on the referral versus 12.5% (5/40) of patients with normal examinations.

Six physicians provided (optional) comments regarding the neurological examination and its role in their practice. Two mentioned rarely detecting abnormalities, and one specifying that this made them doubt the accuracy of their exams. One stated that the neurological examination was almost never the reason they refer, as compared to the history and imaging findings. A fourth said the examination was hard to master but as important as other parts of the physical exam. A fifth said they used the examination more as a tool to follow patients. Finally, a sixth brought up time constraints as a potential limitation to the use of the neurological examination in their practice.

Overall, the survey results demonstrated that although the neurological examination *supported* the decision of primary care physicians to refer patients for specialized neurological care in an important minority of cases, the examination findings only rarely *changed* the physicians' decision of whether to refer. The most commonly indicated reason for referral was the presenting symptom, without a particular suspected diagnosis or examination finding. This is consistent with our experience and with previous reports.<sup>4,7</sup> For instance, in a study from Ireland in which primary care physicians were asked to specify the suspected etiology in their referrals to neurology, a third of physicians left the etiology section blank.<sup>7</sup>

What other factors might influence the decision to refer? Although respondents to our survey highlighted patient requests as being the main reason in only 11% of patients, patient preference and personal concern regarding symptoms are significant drivers of referrals from primary care.<sup>5,8</sup> In one study comparing headache patients referred to neurologists to those who were not referred, the

main differences were a higher number of visits to their primary care doctor and a higher level of anxiety related to the headaches; headache severity was not different between the two groups.<sup>8</sup> There are numerous other physician-related and patient-related reasons that impact decisions to refer such as the care provider's experience, availability of prompt appointments, and geographical factors.<sup>5,9</sup>

Among the comments received in our survey, low frequency of detecting abnormalities, challenge mastering the exam, low trust in one's examination skills, and time constraints were raised as factors limiting the use of the neurological examination in primary care. One might hypothesize that additional training in Neurology could result in the neurological examination having a greater impact on the decision to refer. Our results suggest this might be the case; although only 4 of 26 participants had received such training, they reported more often that the examination influenced their decision to refer. In a previous study of neurophobia among general practice trainees, suggestions for improving neurology education included referral guidelines and instruction on performing a "quick and better neurological examination".<sup>2</sup> In another survey of 25 family physicians regarding comfort with neurology, 11 reported difficulty performing the neurological examination and 21 had difficulty interpreting the findings they did detect<sup>6</sup>; the physicians in this study were offered a list of short courses, the course on the neurological examination was most requested and subsequently most attended.

Even if the neurological examination is not the most important factor in the decision to refer, the presence of abnormal findings did influence the *content* of the referral in approximately one quarter of cases. Previous work found about 50% of referrals from primary care to neurology include examination information.<sup>7,10</sup> This may be of benefit in triaging consultation requests and thus impact patient care. However, with the increased use of telemedicine as a result of the COVID-19 pandemic, the neurological exam may now have a less important role in referral.

Our survey does have weaknesses. The retrospective design may have introduced recall bias, since participants were asked to recall past encounters, some of which had occurred over 90 days prior. Participants were asked to self-report details such as what they wrote on referrals, and we did not attempt to independently confirm this information. Most respondents practiced in a single city and all had university affiliations, which might reduce the generalizability of the findings. Additionally, the small sample size may have impacted the validity of our findings. Finally, our survey did not ask the primary care physicians about patients that were *not* referred to neurology due to a *normal* neurological examination; therefore, although we found that the findings changed the decision in only 5% of patients ultimately referred to neurology, this might represent an underestimation of the examination's influence on the decision to refer if it does not include patients for whom a normal exam was sufficiently reassuring to avoid referral.

Despite these limitations, the results of our survey are important. They reveal that primary care physicians use the neurological examination to reinforce their decision to refer but often do not depend on the findings. Future studies should consider other factors influencing the decisions to refer, not only the neurological examination. Our results suggest that interventions to improve neurological training of primary care physicians may have a greater impact if they target effective history-taking and the development of a symptom-based diagnostic approach rather than examination

skills. Even if this does not change the absolute number of referrals, it may positively influence the quality of referral information provided.

The survey was approved by the Research Ethics Board of the Jewish General Hospital.

**Supplementary Material.** To view supplementary material for this article, please visit <https://doi.org/10.1017/cjn.2022.312>.

**Conflict of Interest.** The authors have no conflicts of interest to declare.

**Statement of Authorship.** SRC and FM contributed equally to the survey conception, data collection, data interpretation, and drafting of the manuscript.

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