



## Brief Communication

## Improving knowledge translation of clinical practice guidelines for epilepsy



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## ABSTRACT

**Background:** Clinical practice guidelines (CPGs) have the potential to improve quality of care. However, implementation of CPGs into the clinical care of people with epilepsy is less than optimal. This study aimed to examine barriers and facilitators to the use of CPGs for the care of people with epilepsy.

**Methods:** A cross-sectional survey of Canadian neurologists was conducted to evaluate CPG use, barriers and facilitators of CPG use among neurologists that manage people with epilepsy were compared with those who do not.

**Results:** Of 311 responders (response rate = 38.7%), 78.7% indicated that they manage people with epilepsy. Neurologists that manage people with epilepsy did not differ from those who do not with regard to demographic characteristics nor in the proportion that report using CPGs in their clinical practice. The barriers and facilitators of CPG use were largely similar between neurologist that do and do not manage people with epilepsy; except applicability of CPGs tended to be less commonly endorsed as a barrier to CPG use by those who manage people with epilepsy compared with those who do not.

**Conclusions:** This study suggests that knowledge, applicability, motivation, resources, and targeting of CPGs to appropriate audience are barriers and facilitators of CPG use among neurologists who manage people with epilepsy. The similarity between barriers and facilitators of CPG use among neurologists who manage people with epilepsy compared with those who do not provides support for the use of a knowledge translation (KT) strategy tailored to these barriers and facilitators of CPG use, and targeted towards neurologists. Implementation of epilepsy CPGs has the potential to improve the quality of care for people with epilepsy.

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## 1. Introduction

The management of people with epilepsy can be challenging because of the diverse presentation and symptomatology, and the number of epilepsy syndromes and seizure types. In addition, people with epilepsy are often managed by an array of health professionals, many of which are not epilepsy experts [1]. Clinical practice guidelines (CPGs), documents that contain systematically developed recommendations based on the best available evidence [2,3], can optimize the management of complex diseases such as epilepsy when implemented into clinical practice [4–6].

A recent study identified 63 CPGs addressing the various aspects of epilepsy care [7]. Thus, guidance for the clinical care of people with

epilepsy is available, yet evidence indicates that epilepsy CPGs are poorly adopted in clinical practice [8–12]. Similarly, studies show poor adherence to indicators of quality care for epilepsy and gaps in the quality of care persons with epilepsy receive [13–15]. In light of these findings, improving the implementation of CPGs into clinical practice may yield improvements in the quality of care of people with epilepsy, as demonstrated for other neurological conditions such as stroke [16].

Implementation of evidence-based medicine, including CPGs, has been a hurdle in many medical fields, and epilepsy is no exception. It can take 17 years and up for evidence to be effectively implemented in clinical practice, yielding knowledge-to-action gaps [17]. The science of knowledge translation (KT), the exchange, synthesis, and application of knowledge among researchers and knowledge users to accelerate the benefits of research, was developed to minimize these gaps [18,19]. Using a KT strategy that considers potential barriers and incorporates strategies tailored to the target user and the material being disseminated can increase the likelihood of successful implementation and the use of evidence-based medicine [18,20–22].

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The objective of the present study was to compare and contrast the barriers and facilitators of CPG use among neurologists who manage people with epilepsy compared with those who do not. The results of this study will help to establish the applicability of a proposed KT strategy for CPGs among neurologists to those neurologists who manage people with epilepsy [23], which may have the potential to improve the adoption of and consequently improve the quality of care (processes of care and clinical outcomes) [5,6].

## 2. Materials and methods

### 2.1. Setting & participants

This study was a population-based, national study of Canadian neurologists. Participants were neurologists who practice within Canada, a publicly funded, universal healthcare system. Neurologists who were retired, on sabbatical or other leave (e.g., maternity), or no longer practiced in Canada during the study period were excluded. Neurologists were chosen as the target professional group because of the following: 1) they are frequently the target audience of epilepsy guidelines [7] and 2) in North America, approximately 70% of adults and most children with epilepsy are referred or have seen a neurologist [24–26]. This study was approved by the University of Calgary Health Research Ethics Board. All participants provided written informed consent prior to participation in the study.

### 2.2. Survey development

The methods for the survey development, distribution, and case ascertainment are described in detail elsewhere [23]. Briefly, a quantitative survey (forced-choice binary questions and statements with 7-point Likert scales anchored with strongly agree and strongly disagree) was developed to determine the barriers and facilitators to the use of CPGs in day-to-day clinical practice among Canadian neurologists. The survey was validated (content validity) and pilot tested using a subsample of neurologists prior to full distribution [23]. The survey was distributed by mail, email, and fax in both of Canada's national languages (French and English). At least three modes of contact (personalized letters, emails, faxes, and phone calls) were used to maximize the response rate.

### 2.3. Data analysis

The current study is a subanalysis of the quantitative, population-based, cross-sectional survey to evaluate differences in CPG use and the barriers and facilitators of CPG use among neurologists that manage people with epilepsy versus those who do not. The characteristics of the

neurologists that reported seeing people with epilepsy in their practice were compared with those that did not using Student t-tests, or  $\chi^2$  when the data was nonparametric. Similarly, CPG use among neurologists who manage people with epilepsy were compared with those who do not using Student t-tests, or  $\chi^2$  when the data was nonparametric.

All quantitative data analyses were conducted using STATA 12 [27]. For all tests of significance, a statistically significant difference was considered to have a p-value of <0.05. In the instances where there were multiple comparisons, an a priori decision to conduct a Bonferroni correction was made by the authors.

## 3. Results

The population-based survey was distributed to 863 neurologists, 58 ineligible neurologists were excluded (e.g., retired, no longer in practice in Canada), and 311 responded for a response rate of 38.7% [23]. The majority (78.7%) of respondents reported that they saw patients with epilepsy (Table 1). Those who managed people with epilepsy, most commonly managed 5–19 people with epilepsy each month (42.1%), followed by <5 people with epilepsy (25.8%), 20–40 people with epilepsy (18.8%), and >40 people with epilepsy (13.3%). The vast majority of neurologists that manage people with epilepsy reported that there was an epilepsy center in their city (86.7%).

There were no significant differences between neurologists that manage people with epilepsy and those who do not with regard to the following: age, sex, years of practice, or the use of CPGs in their clinical practice (Table 1).

The barriers and facilitators of CPG use were broadly similar between neurologists that manage people with epilepsy and those who do not (Table 2). Only applicability of CPGs differed – a smaller proportion of neurologists who manage people with epilepsy endorsed issues with the applicability of CPGs to their clinical practice as a barrier to their use than those who do not (11.9% vs. 22.2% respectively).

## 4. Discussion

The present study fills a gap in understanding and promoting dissemination and implementation of epilepsy CPGs. The barriers and facilitators of CPG use among neurologists that manage people with epilepsy compared with those who do not are more similar than different. These similarities suggest that the recently proposed multidimensional, tailored KT strategy to improve the use of CPGs among neurologists in clinical practice [23] may be applicable to epilepsy CPGs.

The suggested KT strategy for CPGs targeted towards neurologists [23] is evidence-informed and based on behavior change theories commonly employed in implementation science [18,28,29]. This KT strategy

**Table 1**

Characteristics of the sample of neurologists stratified by whether they see patients with epilepsy in their practice or not.

	All responders n = 311	Do not follow patients with epilepsy n = 58 (18.6%)	Follow patients with epilepsy n = 240 (77.2%)	$\chi^2$ *
Sex – male n (%)	212 (68.2%)	41 (70.7%)	164 (68.2%)	p = 0.76
Urban or rural	Urban = 287 Rural = 12	Urban = 47 Rural = 1	Urban = 229 Rural = 11	p = 0.42
Academic affiliation	Yes = 257	Yes = 55	Yes = 203	p = 0.04
Subspecialty**	Yes = 224	Yes = 55	Yes = 169	p < 0.001
Years of practice	16.6 (SD = 12.2)	19.08 (SD = 12.68)	15.78 (SD = 12.14)	p = 0.07
CPG use n (%)	Yes = 238	Yes = 44	Yes = 191	p = 0.50
Median (IQR)***	5 (IQR = 4)	5 (IQR = 2)	5 (IQR = 3)	p = 0.31

Abbreviations: n = sample number,  $\chi^2$  = chi squared, p = p-value, SD = standard deviation, IQR = interquartile range, CPG = clinical practice guideline.

Footnotes: The sum of those that follow patients with epilepsy and those who do not do not equal all responders because of missing data on the question “do you follow patients with epilepsy” for 13 responders.

\* Test of significance comparing those who followed patients with epilepsy with those who did not.

\*\* The percentage of those that were subspecialized in the group that followed patients with epilepsy is 23.08%.

\*\*\* Median of a 7-point Likert scale anchored with 1 = strongly disagree and 7 = strongly agree.

**Table 2**

Determinants of CPG use among neurologists who manage people with epilepsy compared with those who do not.

Barrier	All*	Epilepsy	No epilepsy	p-Value*
	% Yes (n)	% Yes (n)	% Yes (n)	
There are incentives to follow CPGs in my practice	9.7 (29)	8.4 (20)	12.5 (7)	0.33
Lack of knowledge about CPGs is a barrier to their use in my practice	41.2 (121)	40.0 (22)	42.1 (99)	0.77
Time constraints are a barrier to the use of CPGs in my practice	38.7 (115)	38.2 (91)	40.0 (22)	0.81
The applicability of CPGs to my clinical setting is a barrier to their use	34.8 (101)	31.1 (73)	50.9 (28)	0.005
I do not have the skills to perform the standards of care recommended in most CPGs	4.1 (12)	3.4 (8)	7.4 (4)	0.17
I do not have the resources to perform the standards of care recommended in most CPGs	13.8 (40)	11.9 (28)	22.2 (12)	0.05

  

Barrier/Facilitator	All	Epilepsy	No epilepsy	p-Value*
	Median** (IQR)	Median** (IQR)	Median** (IQR)	
My colleagues use CPGs in their clinical practice	5 (2)	5 (2)	5 (2)	0.56
CPG recommendations influence my clinical practice	6 (3)	6 (2)	5 (3)	0.64
The use of CPGs is supported in my institution	5 (2)	6 (2)	5 (2)	0.75
It is easy to perform standards of care outlined in CPGs	5 (2)	5 (2)	5 (1.5)	0.21
Recommendations are often in line with my professional opinion	6 (1)	6 (1)	6 (1)	0.47
The benefit of using CPGs outweighs the costs	4 (3)	3 (3)	4 (2)	0.51
Following CPGs improves the quality of care I deliver	5 (2)	5 (2)	5 (2)	0.94
It is easy to remember the care plan outlined in CPGs when I see patients	5 (2)	5 (2)	4 (2)	0.70
Using CPGs in my practice is worth the effort	5 (2)	5 (2)	5 (2.5)	0.34

Abbreviations: CPG = clinical practice guideline; n = number of participants; IQR = interquartile range (p75–p25); p-Value = p-value of comparisons between those who manage people with epilepsy and those who do not using chi-squared.

Footnote: Epilepsy and CPG No epilepsy may not sum to equal the All group because of missing values on the CPG use question.

\* Test of significance comparing those who followed patients with epilepsy with those who did not.

\*\* Median of a 7-point Likert scale anchored with 1 = strongly disagree and 7 = strongly agree.

presents several interventions to address the main barriers and facilitators of CPG use, but the specific combination of components and implementation interventions will need to be tailored to the local context, setting, and needs of the end users. While not all of the components need to be implemented simultaneously, it is recommended that the KT strategy used be multifaceted in order to adequately address the key barriers identified.

Clinical practice guidelines developed by professional organizations perceived as credible have been identified as a facilitator to implementing CPGs among neurologists [23]. The International League Against Epilepsy (ILAE) and its chapters are seen as reliable sources of information on epilepsy and can play a role in improving the implementation of epilepsy CPGs clinically. In fact, they have already made a substantial contribution to this effort by providing guidance on CPG development methodology that is aimed at improving the applicability of epilepsy CPGs, while maintaining rigorous methodology and hence credibility [30]. One component of the ILAE methodology recommends including patients in the CPG development working group [30]. This reinforces the importance of including patient preferences and patient-directed KT interventions for the successful implementation of CPGs in clinical practice. Future research in this field should be aimed at establishing the role of patients in CPG implementation.

The importance of evaluating knowledge use and the effect of CPGs on clinical care should not be minimized. A study looking at the use of an epilepsy CPG in practice did not find any improvements in care after the implementation of the CPG [8]. However, upon further examination, it was found that the likely source of the negative findings was not the CPG but rather, the failure of the implementation intervention, which was a combination of training and outreach. There is a paucity of high-quality research looking at the effectiveness of KT techniques within neurology, and even more so for epilepsy. This begs for high-quality evidence on the effectiveness of the proposed KT strategy in this population to inform future implementation interventions. Future research in this area should adopt an evidence-based framework to conceptualize and guide the evaluation of the CPG implementation (e.g.,

the Knowledge-to-Action framework) [18] and should include the patient perspective of those living with epilepsy.

While our study has several strengths, such as evidence from a nationally representative, population-based survey administered using rigorous methodology, there are some limitations that should be considered. First, people with epilepsy are often managed by multidisciplinary and multiprofessional teams of healthcare professionals; the generalizability of our findings to other disciplines and professions that manage people with epilepsy is unknown. Second, the survey used to evaluate barriers and facilitators to CPG use was self-reported resulting in a list of perceived barriers and facilitators that may not accurately reflect actual barriers and facilitators. Further exploration using qualitative methods may help to elucidate additional differences.

## 5. Conclusions

The present study provides greater understanding into the barriers and facilitators to the use of epilepsy CPGs in clinical practice. However, the barriers and facilitators among neurologists who manage people with epilepsy do not differ greatly from those for other CPGs targeted towards neurologists. The similarity of barriers and facilitators suggests that an existing KT strategy for CPGs targeted towards neurologists may be applicable to epilepsy CPGs; however, further studies examining the effect of the KT strategy on the implementation of CPGs is needed. Greater implementation of CPGs into clinical practice may improve the quality and safety of care of people with epilepsy.

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## Conflict of interest

All authors have no conflicts of interest to report.

We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this report is consistent with those guidelines.

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