

## Assessing the true learning needs of health care professionals in epilepsy care

Sean M. Hayes<sup>a,\*</sup>, Jeffrey D. Melin<sup>b</sup>, Martin Dupuis<sup>a</sup>, Suzanne Murray<sup>c</sup>,  
David M. Labiner<sup>d</sup>

<sup>a</sup> AXDEV Group, 8 Place Commerce, Suite 210, Brossard, QC, Canada J4W 3H2

<sup>b</sup> American Epilepsy Society, West Hartford, CT, USA

<sup>c</sup> AXDEV Global, Norfolk, VA, USA

<sup>d</sup> Department of Neurology, University of Arizona, Tucson, AZ, USA

Received 3 July 2007; revised 10 August 2007; accepted 13 August 2007

### Abstract

This needs assessment, initiated by the American Epilepsy Society (AES) in cooperation with AXDEV Group Inc. (AXDEV), used a mixed-method approach to explore the educational and clinical practice needs of health care professionals in epilepsy care and to identify significant barriers to caring for people with epilepsy. The multiphase assessment began with key informant interviews with AES educational leaders. In Phase II, 26 stakeholders, including epileptologists, neurologists, professionals in epilepsy care, and people with epilepsy, shared their experiences in epilepsy care during four focus groups at the AES annual meeting. In Phase III, a quantitative online survey based on Phase II results was distributed to 228 respondents, including epileptologists ( $n = 84$ ), neurologists ( $n = 55$ ), professionals in epilepsy care ( $n = 69$ ), and others ( $n = 20$ ). Results of the comprehensive analysis of Phase III quantitative data are presented here. They reveal the unmet needs of health care professionals in this therapeutic domain and are discussed in terms of their implications for epilepsy care.

© 2007 Elsevier Inc. All rights reserved.

**Keywords:** Epilepsy; Health care professionals; Epilepsy care; American Epilepsy Society; Needs assessment; Survey

### 1. Introduction

Health care professionals who care for people with epilepsy need to inform and educate themselves about ongoing changes in epilepsy treatment and management to advance the standard of epilepsy care. Not-for-profit organizations, such as the American Epilepsy Society (AES), play a major role in addressing the educational and supportive needs of epileptologists, neurologists, and other professionals in epilepsy care (e.g., nurses, clinical pharmacists). In the past, the AES has relied principally on experts within various fields of epilepsy care to anticipate the needs of this widespread group.

With the emergence of outcome-based educational initiatives, needs assessments of practicing health care professionals (who are often not “experts”) have become a primary tool for identifying gaps and barriers to change in daily clinical practice. The rationale for a comprehensive needs assessment is to help providers of educational and supportive programs understand the what, how, and why of clinical decision-making behaviors of practicing health care professionals. Analysis of a behavioral needs assessment reveals differences between actual activities in daily clinical practice and optimal clinical practices, that is, “what should be,” as indicated by experts such as key opinion leaders, evidence-based medicine, clinical practice guidelines, and clinical research.

The AES embraced this research paradigm in partnering with AXDEV Group to conduct a comprehensive

\* Corresponding author. Fax: +1 450 465 1155.

E-mail address: [hayess@axdevgroup.com](mailto:hayess@axdevgroup.com) (S.M. Hayes).

behavioral needs assessment from September 2005 to April 2006. The purpose of this assessment was to determine the educational and clinical practice needs of health care professionals who treat and manage individuals with epilepsy and to identify significant barriers to caring for people with epilepsy.

This behavioral needs assessment was designed to elucidate the perceived and unperceived needs of health care professionals in this therapeutic domain, and to discuss the implications of these findings for epilepsy care. The purpose of this article is to report the results of a quantitative survey supported and enriched by qualitative data.

## 2. Methods

This needs assessment used a mixed-method research design. Mixed-method research is defined as a “type of research in which a researcher combines elements of qualitative and quantitative research approaches for the broad purposes of breadth and depth of understanding and corroboration” [1]. Mixed-method research is becoming increasingly recognized as the third major research approach, along with qualitative and quantitative research [1]. In particular, this study incorporated two distinct research components, one qualitative and one quantitative, each with its own questions, data collection processes, and analyses. Both databases were obtained by rigorous data collection methods and analyzed with well-validated procedures.

Triangulation was used to connect and integrate data from both research components in a meaningful way to provide a fuller understanding of the unmet needs of health care professionals in epilepsy care. Triangulated research design is based on the rationale that no single method of data collection can adequately solve the problem of rival causal factors. The concept is based on land-surveying methodology, which measures the distance to a landmark from two different bearings to pinpoint its precise location [2]. This approach strengthens the validity of applied cognitive behavioral data by using a combination of qualitative and quantitative methodologies to examine the same phenomenon, thereby revealing different aspects of an empirical reality [3].

This needs assessment used a mixture of quantitative and qualitative research methodologies during four distinct research phases. Phase I began in September 2005 with a literature review and key informant interviews with AES educational leaders ( $n = 5$ ), who provided direction for subsequent research initiatives and research objectives to investigate. By using the first few interviews as guides, the researchers narrowed the focus of the research and reduced the number of focus groups and/or interviews needed [3].

In Phase II, 26 stakeholders were asked to share their experiences in epilepsy care at four half-day focus groups at the AES annual meeting in December 2005. The four groups were epileptologists, general neurologists, professionals in epilepsy care, and individuals with epilepsy. Focus groups are particularly useful for exploration, by obtaining a rich, in-depth understanding of a topic [3]. Expert moderators guided the focus groups, using a structured set of open-ended questions. These sessions explored current clinical and health care challenges in the continuum of epilepsy care.

What participants say and discuss during the focus group process determines the data to be collected, analyzed, and reported. Therefore, careful selection and recruitment of participants are essential. Phase II employed purposive sampling for the qualitative data collection. This technique is frequently used to study the lived experience of specific populations [3]. Thus, researchers selected subjects to participate in the study based on identified variables under consideration.

Among the health care professionals in three of the focus groups were adult and pediatric epileptologists ( $n = 6$ ), general neurologists ( $n = 5$ ), and professionals in epilepsy care ( $n = 6$ ). Nine persons with epilepsy, chosen from patient support group referrals from the Epilepsy Foundation,

also participated in a focus group. The sample size of each group was small enough to give everyone the opportunity to express an opinion, but large enough to provide a diversity of opinions. The number of focus groups and participants in each were aligned with typical focus group studies [4].

In Phase III, the AES invited health care professionals and other stakeholders in epilepsy care (both AES members and nonmembers) to participate in a quantitative online survey. This phase was conducted to validate the qualitative findings of Phases I and II and to enable group comparisons in the areas of learning needs, competencies, challenges to optimal epilepsy care, and barriers to learning. The survey questions were based on the results of the qualitative needs assessment from Phase II.

Prior to February 2006, the AES distributed a letter of invitation to all 3000 AES members and to nonmembers who attended the 2005 annual meeting. Interested parties were invited to take an online survey, which was forwarded to invited participants at their request. This random sampling attracted 228 respondents over a 3-week period from February 27 to March 9, 2006. The overall response rate to the online survey was 7.6%.

Among the 228 survey respondents were epileptologists ( $n = 84$ ), neurologists ( $n = 55$ ), professionals in epilepsy care ( $n = 69$ ), and others, including case managers, epilepsy foundation executives, academic educators, a geriatric care manager, and volunteer parents ( $n = 20$ ). The group was nearly equally divided between men ( $n = 111$ ) and women ( $n = 117$ ). The respondents were AES members ( $n = 132$ ) or nonmembers ( $n = 96$ ). There were 156 U.S. and 61 foreign participants (11 unknown).

Phase IV, a comprehensive analysis of qualitative and quantitative data, began in March 2006. Data from the literature search, interviews with domain experts (Phase I), interactive focus groups (Phase II), and the national AES online surveys (Phase III) were categorized and coded from multiple perspectives and analyzed by frequency, rank, and means. Data were subjected to a rigorous gap analysis and collaborative analysis from medical, educational, and psychological perspectives. One-way ANOVA statistical analysis was used to compare the groups, with the Statistical Package for the Social Sciences (SPSS) and a conventional  $P$  value of 0.05 (two-tailed).

## 3. Results

The mixed-method analysis identified major barriers to achieving optimal health outcome in the treatment and management of persons with epilepsy. Those barriers were grouped into five themes: attitudes towards persons with epilepsy, treatment, management and referral, health care system, and continuing professional development.

Results from the online survey are presented for each theme, followed by supporting evidence and explanations (the “why”) from the exploratory qualitative phase of the study.

### 3.1. Attitudinal barriers toward persons with epilepsy

Analysis of the attitudes of epileptologists, neurologists, and professionals in epilepsy care toward patients with epilepsy revealed many barriers to positive patient health outcomes. The following issues, in order of importance, were identified as major concerns of all health care professionals with respect to people with epilepsy (Fig. 1): managing patients with multiple needs, for example, comorbid conditions; managing families with unrealistic expectations; managing patients who do not adhere to treatment

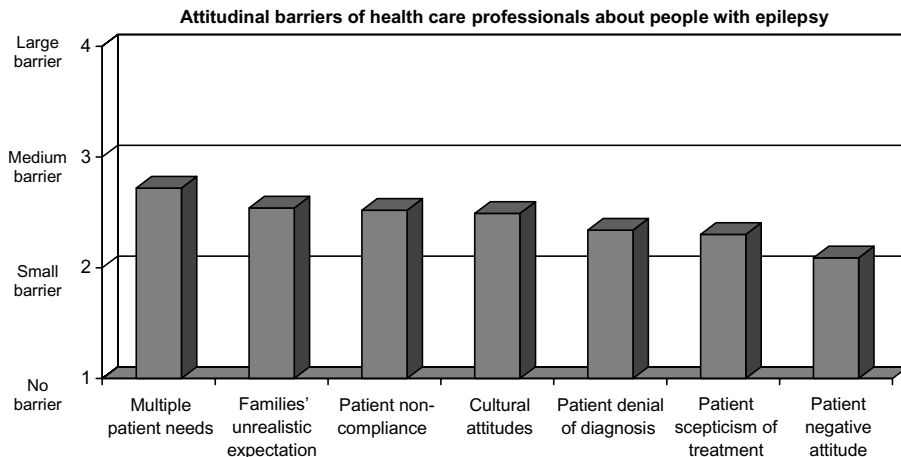


Fig. 1. Attitudinal barriers of health care professionals to positive patient health outcomes in the treatment and management of people with epilepsy. Mean scores ( $n = 228$ ).

protocols; dealing with cultural attitudes and resistance to providing access to care; managing patients who deny or refuse to accept their diagnosis; managing patients who are highly skeptical of treatment; and managing patients with a negative attitude toward health care professionals. No significant differences were found between the attitudes of epileptologists, neurologists, and professionals in epilepsy care toward these patients' issues and challenges.

Professionals in epilepsy care felt that people with epilepsy, if able, should take responsibility for their own care. For example, they pointed out that individuals with epilepsy could become more involved in making telephone calls to schools, filling out forms, and completing other simple tasks. This group perceived that families tend to overprotect children with epilepsy. Some professionals with experience in other fields of care stated that people with epilepsy are the most difficult patients with whom they have worked.

### 3.2. Treatment barriers

All health care professionals perceived treatment as a trade-off (or balancing act) between seizure elimination and undesirable adverse effects. This issue was perceived as the biggest barrier to optimal treatment of people with epilepsy (Fig. 2). The difficulty in managing drug side effects, the reliability of available treatments, the difficulty in diagnosing epilepsy, and the lack of knowledge of treatment followed as barriers to optimal treatment. Specifically, lack of knowledge of current treatment strategies was perceived as a less significant barrier to care by epileptologists versus professionals in epilepsy care ( $P < 0.05$ ). In addition, epileptologists perceived the lack of reliable treatment as a significantly larger barrier than did neurologists and professionals in epilepsy care ( $P < 0.05$ ).

Epileptologists reported only intermittent success with current drug therapies. They admitted to feeling bewildered

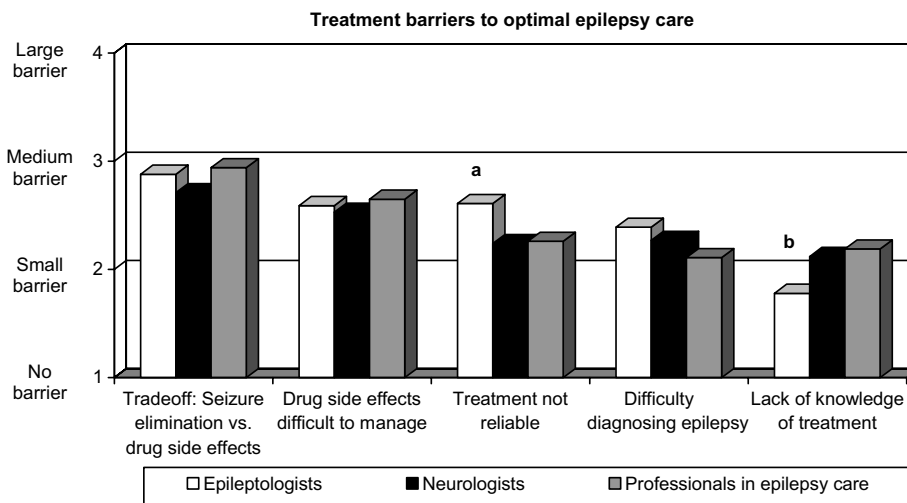


Fig. 2. Attitudinal barriers of health care professionals to optimal treatment of people with epilepsy: interprofessional differences. Mean scores ( $n = 228$ ). (a) Epileptologists rated *treatment not reliable* as a significantly larger barrier than did neurologists and professionals in epilepsy care ( $P < 0.05$ ). (b) Epileptologists rated *lack of knowledge of treatment* as a significantly smaller barrier than did professionals in epilepsy care ( $P < 0.05$ ).

by the lack of consensus among epileptologists about effective treatment choices. “It’s really hard for us,” one epileptologist observed, “to make treatment recommendations to other people when we don’t have a consensus amongst ourselves.”

Neurologists associated an abundance of contradictions, risks, and side effects with current drug therapies. They were skeptical of such guidelines and questioned the driving force behind their development. They perceived the existing guidelines as helpful but not clear or practical and recognized their need to rely on clinical judgment when consulting the guidelines. They expressed concern about the lack of head-to-head trials of epilepsy medications. They expressed a desire for clear guidelines that outline which drug to use under what conditions. In fact, all health care professionals perceived that evidence-based guidelines, based on the results of double-blinded, randomized trials, are not applicable to patients in daily clinical practice. Epileptologists reported that this lack of applicability forces them to rely on experience to guide their practice.

Professionals in epilepsy care perceived that physicians need more education about the risks of current drug therapies, as health care professionals tend to use the same drugs to treat different conditions. They believed that there is a lack of knowledge about the treatment of nonepileptic seizures; that is, these seizures are not well defined and physicians often do not know how to treat them.

Furthermore, epileptologists admitted that they have difficulty in assessing and diagnosing common comorbid conditions in patients with epilepsy. They expressed concern about inadequate access to proper screening tools and discussed the limited usefulness of imaging scans from community clinics. Neurologists reported a feeling of hopelessness in primary screening due to controversial guidelines. Professionals in epilepsy care reported that many patients with nonepileptic seizures are incorrectly diag-

nosed with epilepsy. They believed that video/EEG evaluation is necessary to confirm a diagnosis of epilepsy. They perceived that some individuals with epilepsy have been misdiagnosed with other disorders in the emergency setting, so they never see an epileptologist for proper evaluation or confirmation of their diagnosis.

### 3.3. Management and referral barriers

Health care professionals’ lack of awareness about social services, stigma associated with epilepsy, practice profitability/protection, and difficulty with referrals were rated as the top barriers to the management of persons with epilepsy (Fig. 3). In particular, concerns about profitability and the protection of practices from patient loss by referral were a significantly greater barrier to positive patient outcomes for epileptologists and neurologists than professionals in epilepsy care ( $P < 0.05$ ). This barrier was significantly greater for U.S. versus foreign health care professionals ( $P < 0.05$ ). In addition, professionals in epilepsy care rated the lack of confidence in referrals as a significantly smaller barrier than did epileptologists ( $P < 0.05$ ).

Epileptologists, neurologists, and professional epilepsy caregivers acknowledged that epilepsy is perceived as a social stigma. All considered this perception to be a significant barrier to optimal care and quality of life for individuals with epilepsy. For example, all of these participants identified the social confusion between this neurological disorder and “being crazy” as a major barrier, and all health care professionals mentioned that social prejudice often bars individuals with epilepsy from finding a job.

When discussing referral, epileptologists reported that they almost never refer individuals with epilepsy, particularly children, back to primary care physicians, as they perceive that their patients will not receive appropriate care. They believed that primary care physicians lack an

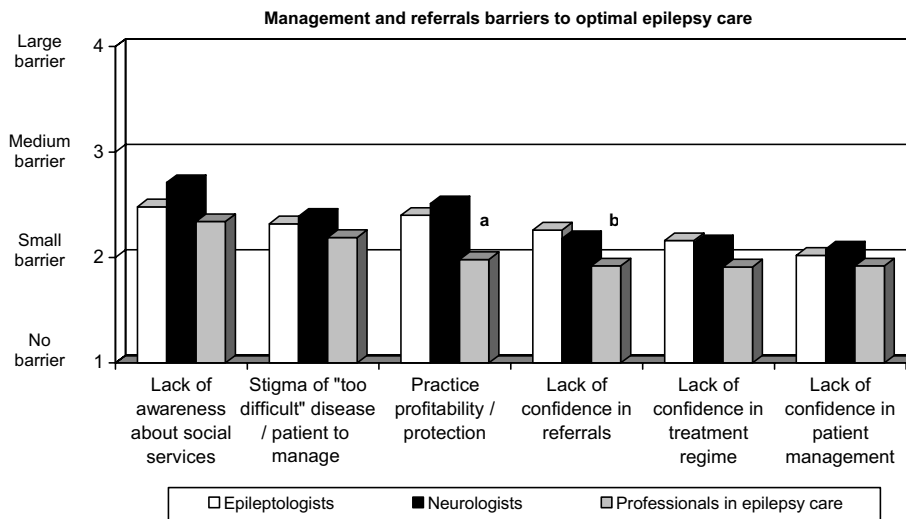


Fig. 3. Attitudinal barriers of health care professionals to positive patient health outcomes in the treatment and management of people with epilepsy: interprofessional differences. Mean scores ( $n = 228$ ). (a) Professionals in epilepsy care rated *practice profitability/protection* as a significantly smaller barrier than did epileptologists ( $P < 0.05$ ). (b) Professionals in epilepsy care rated the *lack of confidence in referrals* as a significantly smaller barrier than did epileptologists and neurologists ( $P < 0.05$ ).

appropriate level of knowledge for adequate epilepsy care and perceived that primary care physicians do not know when to refer patients to specialists. This position reaffirmed specialists' attitudes toward general practitioners, as described earlier. However, professionals in epilepsy care believed that, because they are uncomfortable when dealing with patients with epilepsy, primary care physicians tend to refer patients immediately.

In addition, neurologists reported a struggle with interdisciplinary collaboration. Some admitted that they prefer not to refer patients for financial reasons. Interestingly, professionals in epilepsy care independently perceived that neurologists do not want to refer patients, because they do not want to lose revenue.

In the opinion of many epilepsy specialists, general practitioners have a limited knowledge of epilepsy care but often take on more responsibility for the treatment of

patients with epilepsy than they should. Conversely, epilepsy specialists acknowledged that some specialists allow their own professional arrogance to interfere with the physician–specialist relationship.

3.4. Health care system barriers

Overall, the three greatest system-related barriers to positive patient outcomes were the lack of public awareness of the disease, the availability of social services for patients, and the cost of antiepileptic medications (Fig. 4). In addition, professionals in epilepsy care were significantly more concerned about the shortage of epileptologists and less concerned than epilepsy specialists about the fact that surgery is viewed as experimental ( $P < 0.05$ ) (Fig. 5).

Professionals in epilepsy care reported a lack of support and information for families of individuals with epilepsy.

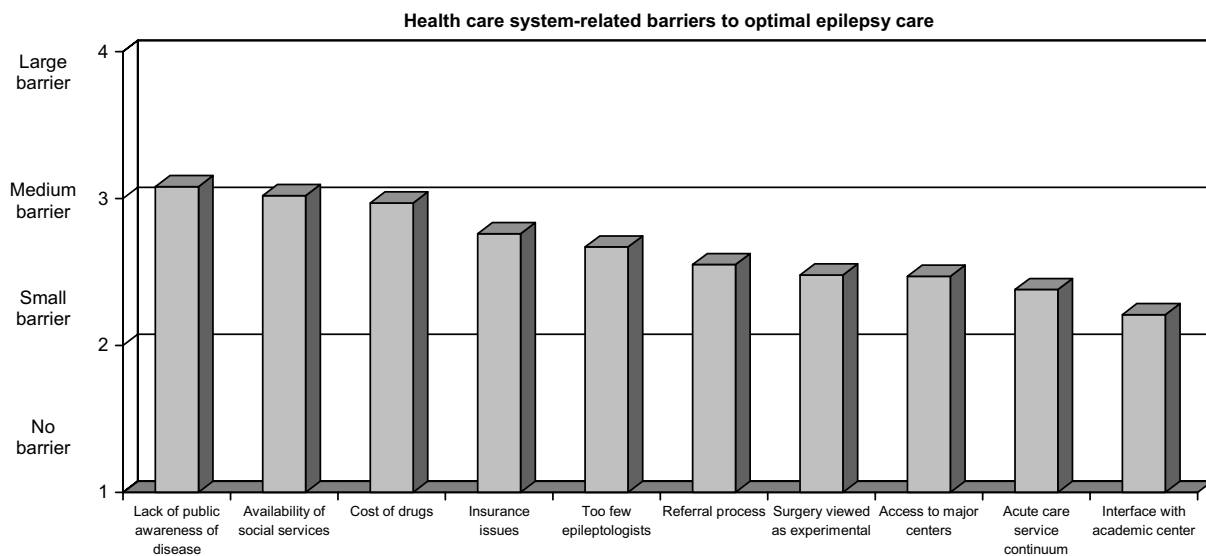


Fig. 4. Health care system-related barriers to positive patient health outcomes in the treatment and management of people with epilepsy. Mean scores ( $n = 228$ ).

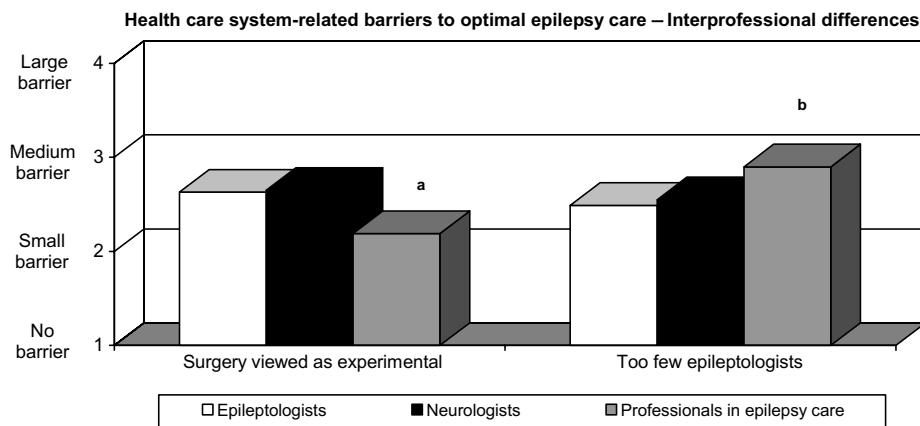


Fig. 5. Health care system-related barriers to positive patient health outcomes in the treatment and management of people with epilepsy: interprofessional differences ( $n = 228$ ). (a) Professionals in epilepsy care rated *surgery as experimental* as a significantly smaller barrier than did epileptologists and neurologists ( $P < 0.05$ ). (b) Professionals in epilepsy care rated *lack of epileptologists* as a significantly larger barrier than did epileptologists and neurologists ( $P < 0.05$ ).

They expressed concerns about not having access to resources that they needed to respond to multiple patient calls. They pointed to a lack of patient educational materials from drug companies.

The cost of antiepileptic medication was a major concern among specialists. Professionals in epilepsy care reported that some individuals with epilepsy who lack medical insurance or access to care are routinely treated in the emergency setting (ER) and have no access to care between trips to the ER. Epileptologists were aware that medical insurance coverage varies greatly across the United States. They believed that it is sometimes easier for people of lower socioeconomic status to obtain coverage, since they qualify for Medicaid. They perceived that dealing with private insurance companies is often a complicated process.

Professionals in epilepsy care expressed their frustration with long waiting lists for epilepsy services and the cost of antiepileptic medications. Individuals with epilepsy had also identified the cost of drugs as a major barrier to positive patient outcomes during the focus group phase. They reiterated their belief that physicians do not care whether or not patients with epilepsy can afford their medications.

Key perceptions among epilepsy specialists regarding the access to care for individuals with epilepsy included the belief that there is a significant shortage of neurologists. Lack of adequate numbers of child neurologists and resultant long waits to see them are perceived as a problematic area of concern. The specialists believed that epilepsy lacks visibility in the spectrum of neurological diseases and does not have the same importance or “reach” within the discipline of neurology as other disorders or diseases, such as

Parkinson’s disease. They agreed that too few resources and specialized programs are devoted to epilepsy.

### 3.5. Continuing professional development barriers

All health care professionals identified a lack of time as the greatest barrier to effective learning. Other major concerns focused on keeping abreast of new developments and dealing with challenges that are presented by evaluating and adopting clinical guidelines in daily practice (Fig. 6). Epileptologists rated the lack of time as a significantly larger barrier and the availability of guidelines as a significantly smaller barrier than the professionals in epilepsy care ( $P < 0.05$ ) (Fig. 7).

All participants identified learning gaps and expressed a desire to expand their knowledge of certain aspects of epilepsy care. Epileptologists needed to learn more about managing patients with epilepsy and comorbidities, such as brain cancer. They perceived the existence of gaps between the knowledge of epileptologists and neurologists or primary-care physicians. For example, they reported that they have experienced difficulties with primary care physicians who fail to follow recommendations for treatment, because primary care physicians lack knowledge about newer therapies and consider them experimental. They reported that this lack of knowledge often results in the use of older medications, which are more likely to cause side effects, for epilepsy therapy.

The learning needs of neurologists related to their perceived lack of knowledge about psychological issues in patients with epilepsy. This group felt that it was difficult to keep abreast of new findings and treatments.

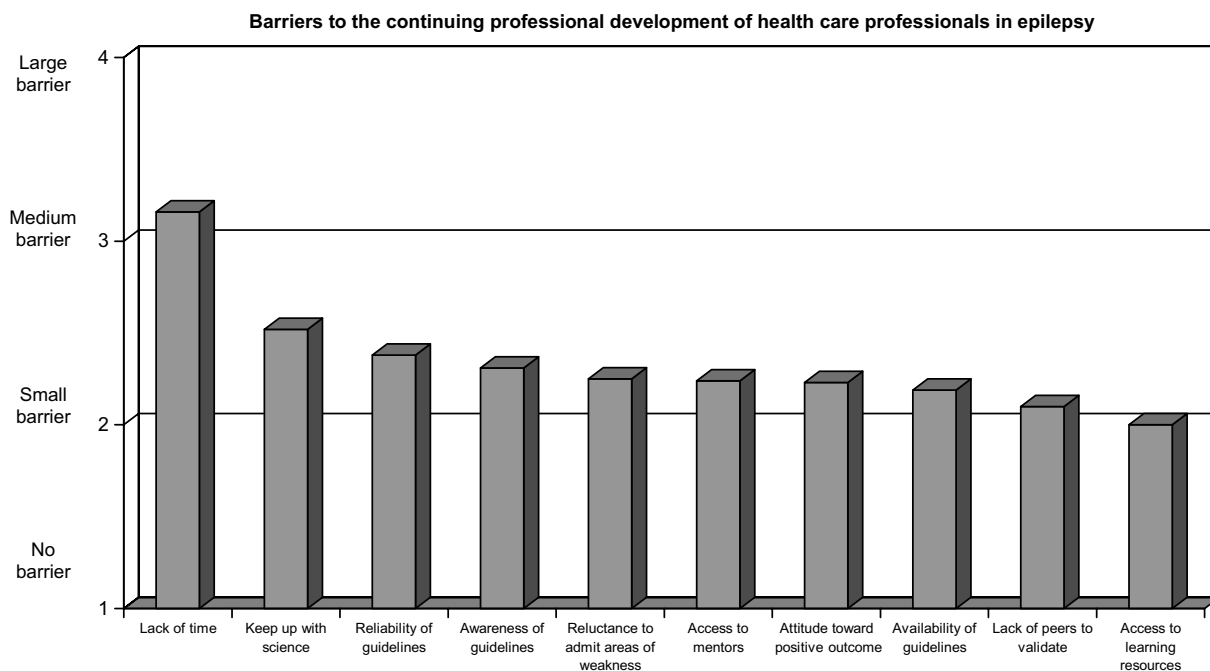


Fig. 6. Health care professionals’ perception of barriers to continuing professional development in the area of epilepsy. Mean scores ( $n = 228$ ).

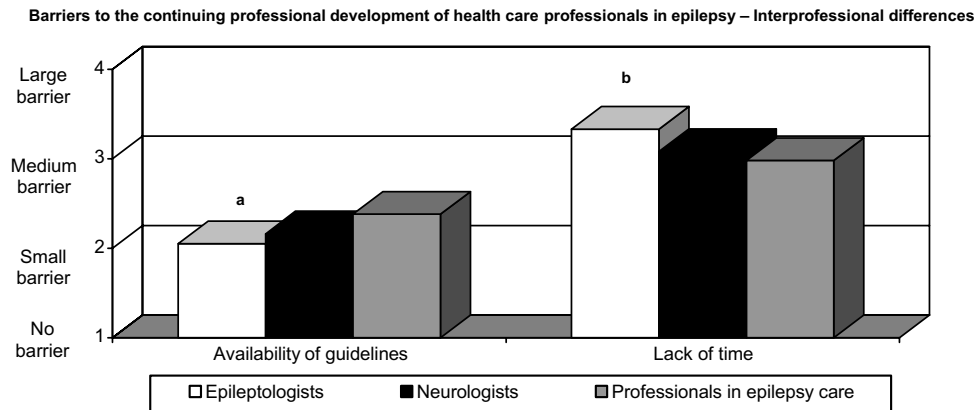


Fig. 7. Health care professionals' perception of barriers to continuing professional development in the area of epilepsy: interprofessional differences. Mean scores ( $n = 228$ ). (a) Epileptologists rated *availability of guidelines* as a significantly smaller barrier to professional development than did professionals in epilepsy care ( $P < 0.05$ ). (b) Epileptologists rated *lack of time* as a significantly larger barrier to professional development than did professionals in epilepsy care ( $P < 0.05$ ).

Professionals in epilepsy care acknowledged their own lack of knowledge about medications for specific subgroups of patients with epilepsy, e.g., pregnant women, patients on concurrent pain medication, and monitoring of side effects for patients in long-term care. They perceived a need, within the community, to train facilitators, such as school teachers and child-care workers, who could educate their peers and coworkers about seizures and emergency care.

#### 4. Discussion

This needs assessment indicates that major stakeholders in epilepsy care continue to face challenges in the societal and clinical settings that are obstacles to the optimal care of individuals with epilepsy.

It is clear that health care professionals firmly believe that public perceptions of epilepsy continue to present a significant barrier for individuals with epilepsy. These professionals acknowledged that epilepsy is associated with a social stigma that impacts employment opportunities.

Patient communication workshops are needed to enhance physician skills and broaden the scope of epilepsy care to address the psychosocial needs of individuals with epilepsy in a time-sensitive manner. The purpose of these workshops would be to broaden the skills of epilepsy specialists to enable them to address the social stigma of epilepsy with confidence in daily practice. In addition, the development of educational interventions that address the management of patients with chronic disorders, with respect to ongoing doctor-patient and doctor-family relationships, are needed to provide best practice standards for long-term epilepsy care.

All health care professionals emphasized the need for practical clinical guidelines that could be used reliably in daily practice. The development of case-study workshops and peer-to-peer interactive programs and educational tools that support the interpretation and application of

guidelines to “real people” may be helpful in eliminating this barrier to optimal care.

The significant impact of barriers to epilepsy care within the health care system emerged at several points in the needs assessment. Health care professionals noted significant gaps in the provision of care due to manpower shortages in the field and financial constraints within the health care system due to the allocation of resources to other neurological problems with higher public profiles and less social stigma. A common complaint among participants was the lack of access to supportive and educational resources for people with epilepsy.

Interdisciplinary care may be the future of epilepsy management, but these results indicate that the roles of patients and health care professionals in this model are not well defined. Some health care professionals, e.g., neurologists, are unsure of their role on the interdisciplinary team, and others have conflicting visions of the roles that their team members should play. For example, perceptions of role of primary-care physicians vary widely between epileptologists, neurologists, professionals in epilepsy care, and individuals with epilepsy. In addition, epileptologists and neurologists perceive that they have overlapping roles and responsibilities. Based on the feedback of professionals in epilepsy care, it appears that epilepsy specialists may need to set aside professional jealousies, jurisdictional issues that negatively influence the referral process, and financial considerations for the good of their patients. An interdisciplinary guideline for clinical practice, i.e., a continuum of care map, developed in cooperation with major stakeholders, could clearly differentiate the roles and responsibilities of various health care professionals and thereby increase the efficiency of epilepsy care.

Epilepsy specialists noted a need for further education and guidance in managing the trade-off between drug benefits and risks. With regard to the latter, concerns about the applicability and shortcomings of clinical practice guidelines were expressed on more than one occasion. Simple tools, such as a drug risk assessment flow chart, could

address these concerns by offering a practical solution. The purpose of such educational materials is to optimize clinical skills to balance the goal of seizure elimination with appropriate risk assessment of drug interactions and adverse effects. Targeted educational interventions may provide these specialists with best practices in the diagnosis, treatment, and management of comorbidities in individuals with epilepsy to close the knowledge gap in this area.

Clearly, individuals with epilepsy need a better social support system to address health insurance needs and remove economic barriers to optimal care. Although physicians are aware of their patients' problems with regard to the cost of medication, they appear more focused on seizure control than financial concerns.

All physicians expressed varying degrees of discomfort with the task of epilepsy management, from the outright avoidance of treating patients to frustration at being unable to achieve optimal patient outcomes. The identification of mentors by local, regional, or national associations, such as the AES, would address this barrier to optimal care by helping physicians to develop a sense of professional fulfillment in this therapeutic domain and diminish the perception that treating and managing patients with epilepsy is demanding and unrewarding.

Some of the limitations of this qualitative and quantitative needs assessment are as follows: Participants included only AES conference attendees, therefore the applicability of the results to individuals who don't attend the meeting is unknown. The focus of the needs assessment was driven by professional needs. The inclusion of patients in the quantitative phase may have provided additional insights into the issues raised in this study. During the quantitative phase, survey participants were solicited from an AES list of 3,000 members and non-members who attended the 2005 annual meeting. The survey response rate was 7.6% during the three-weeks timeframe allowed to answer. While

in a study of this type this is an acceptable percentage, ideally a higher participation rate could be obtained. To get a higher response rate, future research should consider expanding the timeframe allowed to answer the survey as well as the use of an invitation to participate in follow-up.

## 5. Conclusions

This AES needs assessments has unearthed valuable information about the attitudes and practices of major stakeholders in epilepsy care. The data indicate that learning gaps and barriers to change continue to present clear obstacles to optimal epilepsy care in an era that has witnessed the development of more effective medical and surgical management strategies for this chronic disorder. Some of these obstacles are basic and longstanding. They must be adequately addressed by targeted educational initiatives before progress can be achieved in epilepsy care.

## Acknowledgments

This needs assessment was conducted by AXDEV Group Inc. on behalf of the American Epilepsy Society, who funded the study. The authors acknowledge the contributions of Frances E. Jensen, M.D., L. James Willmore, M.D., and M. Suzanne C. Berry, MBA, CAE, from the American Epilepsy Society.

## References

- [1] Johnson RB, Onwuegbuzie AJ, Turner LA. Toward a definition of mixed methods research. *J Mixed Methods Res* 2007;1:112–33.
- [2] Denzin NK. *The research act: a theoretical introduction to sociological methods*. New York: McGraw–Hill; 1978.
- [3] Patton MQ. *Qualitative evaluation and research methods*. Newbury Park, CA: Sage; 1990.
- [4] Krueger RA. *Focus groups: a practical guide for applied research*. 2nd ed. Thousand Oaks, CA: Sage; 1994.