# Healthcare Resource Utilization among Persons with Epilepsy Treated by Different Healthcare Providers

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## Background & Objective

- According to the Center of Disease Control and Prevention, approximately 5.1 million people in the United States have been diagnosed with epilepsy.[1]
- The 2011 age-adjusted incidence rate for epilepsy is estimated at 79.1/100,000 population in the U.S.[2]
- A prior study found that neurologist care in chronic neurologic illness was associated with greater disease-specific treatment utilization, but with fewer adverse events and less acute care utilization.[3]
- A previous claims database study concluded that neurologists and physicians near an epilepsy center were more likely to prescribe second-generation antiepileptic drugs. The use of second-generation antiepileptic drugs was associated with a decrease in hospital visits. [4]
- No study has evaluated the healthcare resource utilization and out-of-pocket costs based on the primary care provider among people with epilepsy from the caregiver's perspective.

**The objective of the study was to examine healthcare resource utilization and costs as a function of epilepsy provider type among persons with epilepsy (PWE) from the caregiver's perspective.**

## Methods

- A cross-sectional survey of caregivers of persons with epilepsy (PWE), recruited through the Epilepsy Foundation and Light Speed Research panels, was performed.
- Participants were English-speakers aged 18 and over, who reported being a caregiver of a PWE.
- Caregivers from the Epilepsy Foundation (n=247) were recruited to participate in the survey using email blasts, social media and through a link on their website. Members of the Lightspeed Research Panels (n=253) were recruited by email invitation and screened for inclusion criteria.
- IRB approval was obtained for the survey through the Sterling Institutional Review, Atlanta, Georgia.
- The survey assessed:
  - Patient & caregiver demographic characteristics
  - Aspects of epilepsy provider management
  - Epilepsy severity and treatment
  - Resource utilization (past six months)
  - Out-of-pocket costs (monthly for epilepsy treatment)
- PWE's primary healthcare provider for the management of their epilepsy were stratified into either neurologists/pediatric neurologists or general practitioners.
- T-tests, Kruskal-Wallis tests, Chi-square tests and generalized linear regressions assessed differences across treating physician.

## Results

- PWE treated by a neurologist vs. a general practitioner were less likely to have had at least one hospitalization for the treatment of epilepsy in the past six months (27.4% vs. 40.9%, p=0.01).
- After adjustments, PWE treated by a neurologist vs. a general practitioner reported fewer hospitalizations (0.43 vs. 0.80, p=0.04). No significant differences were found on the number of provider visits or ER visits.
- After adjustments, PWE treated by a neurologist vs. a general practitioner reported lower out-of-pocket costs due to hospitalizations ($8.93 vs. $374.02). No significant differences were found for antiepileptic medication or total monthly out-of-pocket costs.

## Results

### Healthcare Resource Utilization

***Figure 1. Characteristics of Persons with Epilepsy***

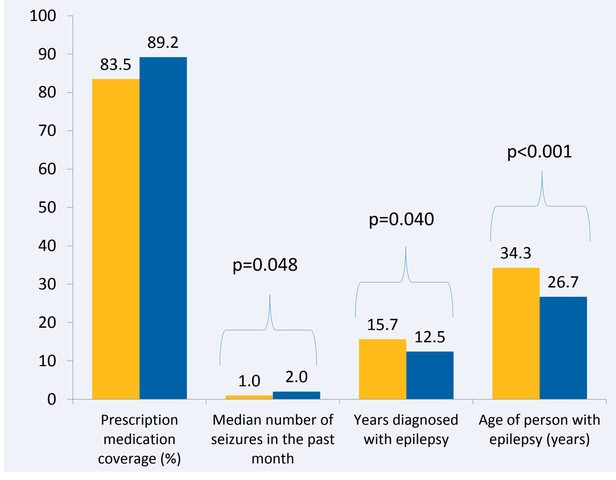



***Figure 2. Utilization for Persons with Epilepsy***

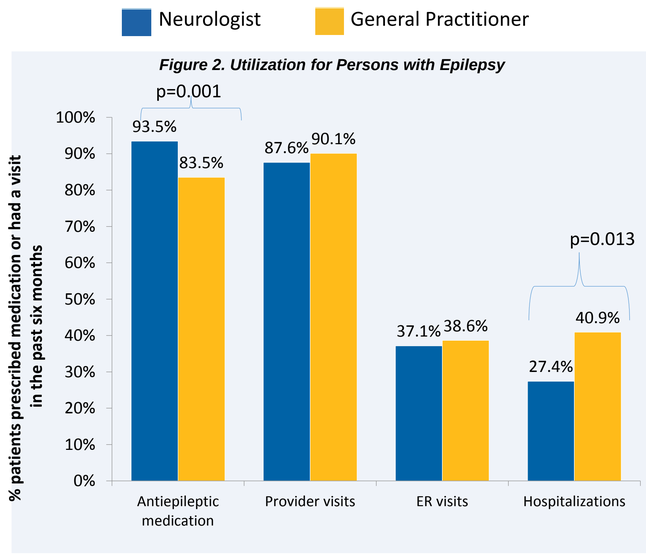
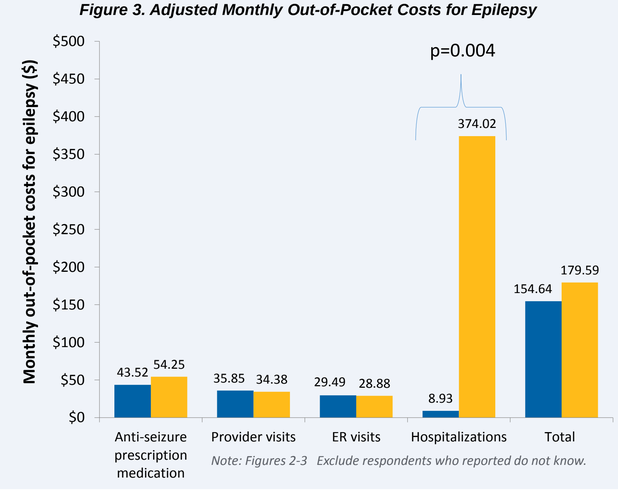



***Figure 3. Adjusted Monthly Out-of-Pocket Costs for Epilepsy***




*Note: Figures 2-3 Exclude respondents who reported do not know.*

***Table 1. Caregiver characteristics and demographics***

| Characteristic | N=500 |
|---|---|
| Gender - Female (%) | 400 (80.00%) |
| Age (years), Mean ± SD | 44.32 ± 12.99 |
| Length of time providing care (Total Months)*, Mean ± SD | 136.89 ± 126.60 |
| Relationship to the person with epilepsy | |
| My spouse/significant other (%) | 99 (19.80%) |
| My parent/parent in-law (%) | 24 (4.80%) |
| My sibling/sibling in-law (%) | 33 (6.60%) |
| My child/stepchild (%) | 275 (55.00%) |
| Other (%) | 69 (13.80%) |
| # of hours in a typical week provide assistance, care, supervision and/or companionship to the person with epilepsy, Mean ± SD | 57.43 ± 51.80 |
| Charlson Comorbidity Index, Mean ± SD | 0.30 ± 0.97 |
| Body Mass Index, Mean ± SD | 28.81 ± 7.78 |
| Marital status | |
| Married/Living with partner (%) | 354 (70.80%) |
| Single, never married/divorced/separated/widowed (%) | 142 (28.400%) |
| Decline to answer (%) | 4 (0.80%) |
| Highest level of education | |
| Less than college degree (%) | 301 (60.20%) |
| College graduate or higher (%) | 193 (38.60%) |
| Decline to answer (%) | 6 (1.20%) |
| Income categories | |
| Less than $25,000 (%) | 97 (19.40%) |
| $25,000 - $49,000 (%) | 150 (30.00%) |
| $50,000 - $75,000 (%) | 90 (18.00%) |
| Over $75,000 (%) | 124 (24.80%) |
| Decline to answer (%) | 39 (7.80%) |
| Currently have health insurance (%) | 448 (89.60%) |

**30 respondents could not recall*

***Table 2. Person with epilepsy demographic characteristics and resource utilization by treating physician***

| Characteristic | Neurologist/ Pediatric Neurologist (N=397) 79.4% | General Practitioner (N=103) 20.6% | p-value |
|---|---|---|---|
| Age of epilepsy person*, Mean ± SD | 26.72 ± 17.58 | 34.26 ± 19.00 | *<.001* |
| Female gender of person with epilepsy | 185 (46.60%) | 45 (43.69%) | *0.60* |
| Type of insurance coverage | | | |
| Insurance coverage through a current/former employer | 35 (8.82%) | 16 (15.53%) | *0.04* |
| Insurance coverage through spouses/parents employer | 147 (37.03%) | 22 (21.36%) | *0.003* |
| Individual/Family insurance plans | 22 (5.54%) | 13 (12.62%) | *0.01* |
| Individual/Family insurance plans thru a State Health Exchange | 17 (4.28%) | 3 (2.91%) | *0.55* |
| Medicaid (MediCal for California residents) | 118 (29.72%) | 26 (25.24%) | *0.43* |
| Medicare | 70 (17.63%) | 23 (22.33%) | *0.23* |
| Veterans administration (VA)/CHAMPUS | 7 (1.76%) | 3 (2.91%) | *0.44* |
| TRICARE | 11 (2.77%) | 1 (0.97%) | *0.30* |
| Other | 24 (6.05%) | 9 (8.74%) | *0.30* |
| Do not know or Not sure | 8 (2.02%) | 9 (8.74%) | *<.001* |
| Health insurance cover prescription medications | 354 (89.17%) | 86 (83.50%) | *0.31* |
| Years diagnosed with epilepsy^, Mean ± SD | 12.45 ± 12.02 | 15.65 ± 13.42 | *0.04* |
| Seizures in past month, Median (q25 - q75) | 2.00 (0.00 - 8.00) | 1.00 (0.00 - 4.00) | *0.05* |
| # of doctor visits in the past 6 months for treatment of epilepsy^, Mean ± SD | 3.12 ± 3.99 | 3.15 ± 4.27 | *0.760* |
| # of ER visits in the past 6 months for treatment of epilepsy^, Mean ± SD | 2.55 ± 3.24 | 2.24 ± 2.03 | *0.012* |
| # of hospitalizations in the past 6 months for treatment of epilepsy^, Mean ± SD | 2.17 ± 2.66 | 1.89 ± 2.34 | *0.036* |
| Anti-seizure prescription medications - Average monthly out-of-pocket cost^, Mean ± SD | 66.06 ± 214.33 | 49.13 ± 71.73 | *0.50* |
| Doctor visits - Average monthly out-of-pocket cost^, Mean ± SD | 47.68 ± 156.23 | 42.13 ± 83.33 | *0.79* |
| ER visits - Average monthly out-of-pocket cost^, Mean ± SD | 41.60 ± 260.84 | 47.06 ± 157.60 | *0.87* |
| Hospitalizations (staying overnight) - Average monthly out-of-pocket cost, Mean ± SD | 65.71 ± 377.94 | 223.66 ± 1228.82 | *0.047* |

**age was not provided for 12 respondents, insurance type categories are not mutually exclusive. ^75 respondents did not know or couldn't recall length of time diagnosed, ^excludes respondents who reported do not know.*

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## Limitations

- All data in the current study was self-reported, so no clinical validation of diagnoses, treatment use and severity of symptoms was available.
- The survey was Internet-based and thus may not be representative of the entire U.S. epilepsy caregiver's population.
- Due to the self-report nature of the survey, there may have been some recall bias.

## Conclusions

- According to caregivers, persons with epilepsy who are treated primarily by a neurologist were more likely to receive antiepileptic medications and were less likely to have a hospitalization when compared with a general practitioner – notwithstanding they had the same outpatient utilization and total out-of-pocket costs.
- These results will inform providers and payers on the benefit of receiving treatment for epilepsy through a specialist.

## References

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