

# Estimating the Incremental Burden of Dysphagia in Epilepsy Patients: A Retrospective Payer Database Analysis

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## Introduction:

- Epilepsy is a chronic disorder characterized by recurrent seizures, and is one of the primary neurologic conditions associated with dysphagia (difficulty swallowing).
- The successful treatment of epilepsy with antiepileptic drugs (AEDs) can depend on the patient's adherence to medication and literature has shown that non-adherence, often affected by dysphagia, is a significant issue in this population.
- This study estimated the annual incremental healthcare burden of dysphagia in individuals with epilepsy.

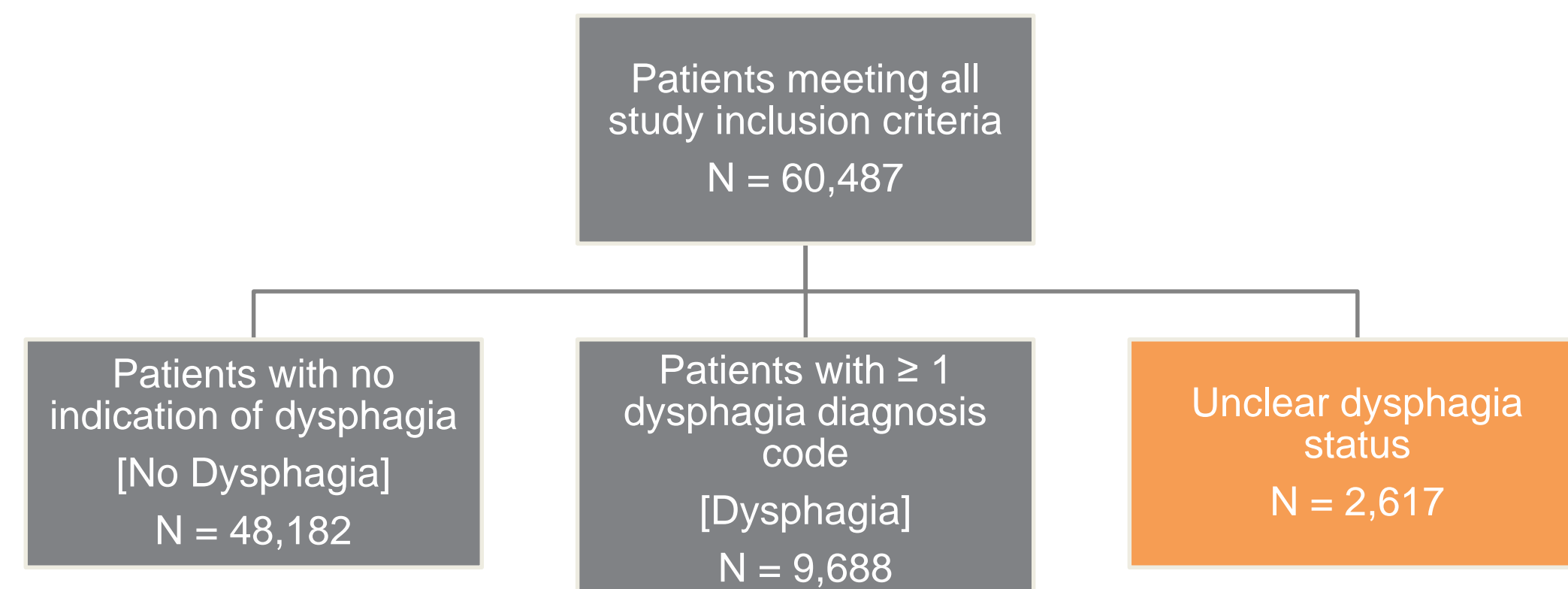
## Methods:

- Data from MarketScan® Commercial Claims and Medicare Supplemental database (Truven Health Analytics, New York, NY) from 2010 Q3 through 2015 Q2 were used.

Study inclusion criteria:

- [1] ≥ 2 visits with record of epilepsy (first record is index date),
- [2] ≥ 6 months pre and ≥ 24 months post medical and pharmacy enrollment relative to index date of epilepsy,
- [3] ≥ 2 pharmacy fills for an AED in the first two years and,
- [4] ≥ 10 years of age.
- Patients with one or more ICD-9 diagnosis code(s) associated with dysphagia were included in the Dysphagia cohort. As a comparison group, the No Dysphagia cohort had no record of a dysphagia diagnosis, did not have a swallowing study, or a pharmacy fill for a liquid form of AEDs in the database.

## Figure 1. Attrition Diagram



## Methods Continued:

- Demographics and comorbid conditions including the Elixhauser Comorbidity Index were summarized for each cohort.
- Dysphagia patients were matched to non-dysphagia patients using demographic and comorbid conditions in a combination of propensity score and direct matching.
- After matching, adherence to AED medication was estimated for each month.
- The incremental healthcare burden (in 2016 dollars) of dysphagia was estimated for all patients and a Medicare subset using the gamma log link model with further adjustments for covariates that remained unbalanced after matching.

## Results:

- The inclusion criteria were met by 60,487 patients, 9,688 (16%) of which had a diagnosis of dysphagia, 48,182 (80%) had no evidence of dysphagia and 2,617 (4%) had unclear dysphagia status. (Figure 1) The group with unclear dysphagia status were not further analyzed.
- The Dysphagia cohort had a higher median age (60 years) in comparison to the No Dysphagia cohort (49 years). Similarly, 43.5% of the Dysphagia cohort had Medicare Supplemental insurance versus 19.9% in the No Dysphagia cohort. (Table 1)
- The Dysphagia cohort were sicker in comparison to the No Dysphagia cohort, with an average Elixhauser Comorbidity Index score of 3.8 versus 2.3. (Table 1)

## Results Continued:

Table 1. Patient Characteristics Before Matching

	No Dysphagia Cohort		Dysphagia Cohort	
	N	Percent	N	Percent
<b>Total Patients</b>	<b>48,182</b>	<b>100%</b>	<b>9,688</b>	<b>100%</b>
<b>Age (years)</b>				
Median	49		60	
Mean	47.3		58.0	
Std. Deviation	19.57		20.13	
<b>Gender</b>				
Male	22,106	45.9	3,727	38.5
Female	26,076	54.1	5,961	61.5
<b>Insurance Coverage</b>				
Commercial	38,614	80.1	5,475	56.5
Medicare Supplemental	9,568	19.9	4,213	43.5
<b>US Region</b>				
Northeast	9,015	18.7	1,856	19.2
North Central	12,570	26.1	3,059	31.6
South	16,881	35.0	3,303	34.1
West	9,327	19.4	1,392	14.4
Unknown	389	0.8	78	0.8
<b>Elixhauser Comorbidity Index</b>				
Mean	2.3		3.8	
Std. Deviation	1.69		2.41	

- The matching yielded 3,974 pairs overall and 1,316 pairs in the Medicare subset.
- Medication adherence by each group after matching are shown in Figure 2 for the overall cohort. The graph suggests lower adherence rates for the Dysphagia cohort over the two year period with bigger differences in the first year in comparison to the No Dysphagia cohort.
- Table 2 displays the results of the multivariable models for the annual healthcare burden of dysphagia in patients with epilepsy for the entire sample and for the Medicare subset.
- The incremental burden for year one was \$16,107 for the entire sample and \$14,550 for the Medicare subset.

## Results Continued:

Figure 2. Patient AED Adherence After Matching

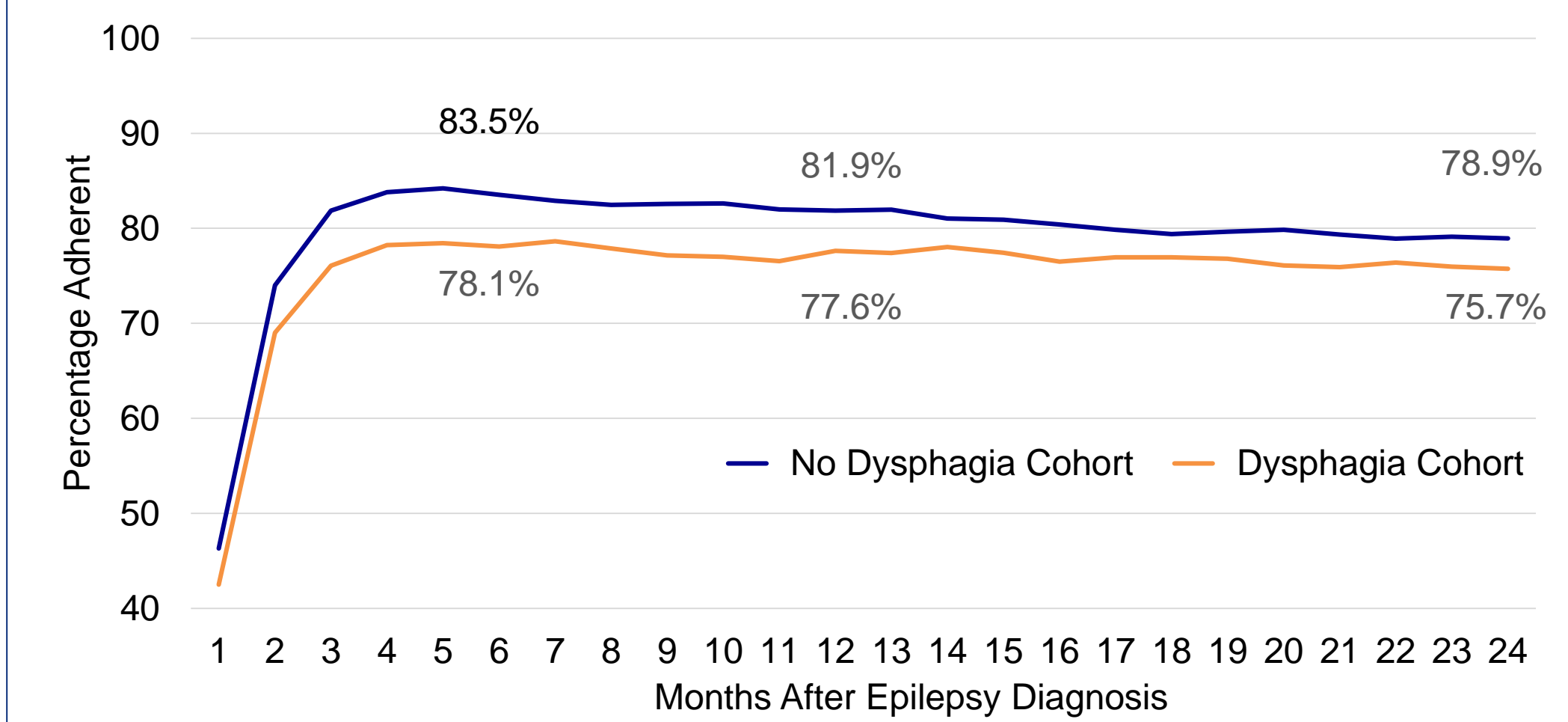


Table 2. Estimated Annual Healthcare Burden\* of Dysphagia for the First and Second Year After Epilepsy Diagnosis in Matched Cohorts

Dataset	Time Period	No Dysphagia Cohort	Dysphagia Cohort	Difference
Overall Cohort	Year 1	\$23,510	\$39,617	\$16,107
Overall Cohort	Year 2	\$17,919	\$33,663	\$15,745
Medicare Subset	Year 1	\$25,741	\$40,291	\$14,550
Medicare Subset	Year 2	\$20,731	\$32,833	\$12,102

\*Healthcare Burden was defined as (adjusted to 2016 US dollars) the sum of inpatient, outpatient and outpatient pharmacy expenditures within each time period.

## Conclusions:

- Epilepsy patients with dysphagia were significantly older and had higher rates of chronic disease when compared to epilepsy patients without dysphagia.
- After matching, dysphagia patients had less adherence to their AED medication and had a higher healthcare burden with an estimated incremental cost of approximately \$16K per year.

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