INTRODUCTION:
- Multiple sclerosis (MS) is an acquired, inflammatory and immune mediated disorder of the central nervous system characterized by inflammation, demyelination and degeneration of axonal neurons that affects more than 2 million people worldwide, and estimates range from 350,000 to 440,000 in the United States.1,2
- Comorbid conditions are a major component of the cost of illness calculations for MS, and research has identified a number of associated conditions/symptoms including the loss of mobility and spasticity, pain, tremor, abnormal eye movements, paraesthesias, urinary bladder dysfunction, sexual disturbances, fatigue and depression.3,4 Anxiety, diabetes, hypertension, hyperlipidemia and urinary bladder dysfunction are also widely documented in association with MS.
- Few studies have looked objectively at the prevalence of comorbid disorders and their associated costs in adults with MS.

OBJECTIVE:
- The goal of the current analysis was to evaluate the prevalence and costs of a comprehensive list of comorbid disorders (using the 17 Major and 261 Specific categories determined by the Agency for Healthcare Research and Quality [AHRQ]) in employees with and without multiple sclerosis.

METHODS:
- A retrospective analysis was performed on data (2001 to 2007) from the Human Capital Management Services (HCMS) Research Reference Database consisting of approximately 150,000 employees representing the retail, service, manufacturing, and financial industries.
- Employees with Multiple Sclerosis were identified with a primary, secondary, or tertiary diagnosis using the International Classification of Diseases, 9th Revision (ICD-9-CM) diagnostic codes for multiple sclerosis.
- The index date in the MS group was defined as the therapy initiation date or the largest prevalence differences that were either:
  - those associated with MS in the literature.
  - those associated with higher costs and more services for management of comorbidities (such as prescriptions for overactive bladder) would only be identified if they were associated with a medical claim.
- Because the database only reflects recent employee history, comorbidities and other activities that happened prior to each subject’s index date might not be captured.

LIMITATIONS:
- While this study adds to the body of evidence about comorbidities among subjects with and without multiple sclerosis, the study has the usual limitations characteristic of database studies using administrative claims, i.e., lack of severity classification. MS stage or type, and may not be representative of all MS patients who are not diagnosed, or who are not treated, or not able to maintain employment.
- Persons who were using prescription therapy for management of comorbidities (such as prescriptions for antidepressant Blackbox) would only be identified if they were associated with a medical claim.
- For each employee with MS, 20 employees without MS were matched 20:1 to employees with MS by matching on propensity scores built from the demographic data.

CONCLUSIONS:
- Using propensity-score matched cohorts, the study controlled for differences between cohorts and found that employees with MS have more prevalent comorbid conditions than subjects without MS.
- From an insurer’s perspective, this increased comorbidity burden for MS sufferers is also associated with higher costs and more services for almost all major diagnostic categories.
- Further investigation is needed to understand the relationship between MS and co-existing conditions.

References
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OBJECTIVES: Evaluate the prevalence and costs of comorbidities in employees with/without multiple sclerosis (MS).

METHODS: A US employee healthcare claims database from 2001-2007 was used to identify subjects with MS (ICD-9 code=340.XX) and a control cohort without MS. The control group was matched 20:1 to the MS subjects on demographics, job-information, geography, and Charlson Comorbidity Index. Based on ICD-9 codes, direct medical costs associated with the Agency for Healthcare Research and Quality 17 Major and 261 Specific Diagnostic Categories (MDCs and SCs) were identified. Index dates for the MS cohort were the diagnosis or therapy initiation date, and for Controls the average MS date. The 12-month post-index date utilization and costs were analyzed. Prevalence comparisons were tested using z-scores of log odds ratios and cohort cost comparisons using t-tests ($P<0.05$).

RESULTS: A total of 765 employees with MS and 15,300 matched controls were analyzed. The MS cohort had significantly higher prevalence of 15/17 MDCs and were significantly costlier in 7. The top more prevalent MDCs were: Nervous System+Sense Organs, Musculo Connective Tissue, and “Other Conditions” which had 53.4%, 18.2% and 17.1% higher prevalence, respectively and were $1837, $256, and $241 more costly, respectively. However, it was surprising to see the prevalence and higher cost of conditions like: Circulatory System (31.1%–21.9%; $568–$235) Mental Disorders (20.7%–11.6%; $147–$61) Digestive System (23.9%–16.2%; $369–$193); Skin & Subcutaneous Tissue (25.4%–19.7%; $129–$69). Evaluating these using the “specific categories”, significantly higher prevalence and costs were reported among the MS cohort in: other nervous system disorders, headache and migraine, epilepsy convulsions, blindness and vision defects, dizziness/vertigo, other mental conditions.

CONCLUSIONS: Employees with MS have more prevalent comorbid conditions than subjects without MS. From an insurer’s perspective, this increased burden for MS sufferers is also associated with higher costs.