274 Cost and burden of eye disease and visual impairment
Monday, May 04, 2015 3:45 PM–5:30 PM
Exhibit Hall Poster Session
Program #/Board # Range: 2126–2147/A0045–A0066
Organizing Section: Clinical/Epidemiologic Research
Contributing Section(s): Immunology/Microbiology, Retina, Visual Psychophysics/Physiological Optics

Program Number: 2126 Poster Board Number: A0045
Presentation Time: 3:45 PM–5:30 PM
Costs of Glaucoma Care to Patients
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Purpose: Office visits required for routine glaucoma care cost billions in direct costs, but the costs of these visits to the patient (patient cost) have not been assessed in the United States. Knowledge of patients’ costs of glaucoma monitoring is critical to better assess the cost-effectiveness of alternative models of glaucoma care delivery.

Methods: We designed and distributed a cross-sectional survey to 300 patients with glaucoma in hospital-based and community-based glaucoma subspecialty clinics. The survey included demographic factors and all patient costs related to the visit including cost of transportation, time, child care, and lost wages. We graded patient visual fields by severity using Brusini’s GSS-2 staging model. We calculated the mean cost per visit and yearly costs per patient. We determined predictors of mean and yearly cost using univariate and multivariate analysis.

Results: Of the 300 patients, 187 (62%) were female, 171 (57%) were African American, and 114 (38%) were Caucasian. The mean age was 65 +/- 14 years. The mean patient cost per visit was $38.02 +/- $73.15. The mean yearly cost of all visits was $176.09 +/- $327.23. The mean cost of the visit including leisure time lost was $44.09 +/- $72.67. The mean yearly cost of the visit including leisure time lost was $210.41 +/- $333.32. Patients with companions paid significantly more ($51.42 +/- $90.65 vs $26.60 +/- $51.58, P < .001) and retired patients paid significantly less ($21.64 +/- $25.67 vs $51.42 +/- $93.89, P = .038). Mean cost per visit did not vary with age (P = .340), gender (P = .409), race (P = .274), disease severity (P = .928), or education (P = .084). Median household income (P = .005) and presence of companion (P < .001) were significant predictors for increased yearly cost. Additionally, there was no significant difference in mean cost between patients attending either the community-based or hospital-based clinics (P = .308).

Conclusions: We found that specific patient groups have an increased cost burden for glaucoma care. We determined that patients with companions and those currently employed paid significantly more for each visit, while patients with a high median household income paid significantly more per year. Our study is the first to comprehensively assess these costs in the United States. These results show the need to potentially reevaluate the frequency of visits or perhaps utilize telemedicine to reduce the patient cost.

Commercial Relationships: Emily Schehelein, None; Lily Im, None; Alan L. Robin, Aerie Pharmaceuticals (S), Allergan (S), Biologic (C), Glaukos (I), Lupin Pharmaceuticals (C), Merck (S), Sucampio (C); Osamah Saeedi, None
Support: Proposed Research Initiated by Students and Mentors (PRISM) Program Award, University of Maryland School of Medicine

Program Number: 2127 Poster Board Number: A0046
Presentation Time: 3:45 PM–5:30 PM
Laser trabeculoplasty in open-angle glaucoma: healthcare costs and predictors of treatment
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1Department of Pharmacy Science and Practice, University of Arizona, Tucson, AZ; 2Global Health Outcomes Strategy and Research, Allergan, Inc., Irvine, CA; 3Department of Ophthalmology, Jules Stein Eye Institute, University of California - Los Angeles, Los Angeles, CA.

Purpose: Laser trabeculoplasty (LT) is an alternative to topical medications for the treatment of open-angle glaucoma (OAG). However, patient characteristics and healthcare costs associated with receiving LT have not been well studied. The purpose of this analysis was: (1) identify predictors of LT treatment vs. continuation of glaucoma medications (Rx); and (2) estimate the resource utilization and costs associated with the use of LT vs. Rx.

Methods: This study used medical and pharmacy data between 2007-2012 from an insurance claims dataset that included over 150 million individuals. Patient inclusion required at least two OAG ICD-9-CM codes one week apart and an LT claim (LT cohort index date) or second medication class claim (Rx cohort index date) after prior treatment with prostaglandin analog monotherapy. Patients were followed for 12 months pre and 24 months post index date. Attributes used to predict use of LT therapy included age, sex, employment status, Rx adherence, number of comorbidities, and geographic region. Costs included glaucoma specific Rx and CPT codes. Medical encounters and Rx claims were evaluated pre and post treatment. Comparisons between the groups were analyzed using Chi-square and Student’s t-tests (descriptive); logistic regression (predictive); and generalized linear models (cost).

Results: The study included 4,743 LT and 16,484 Rx patients. Baseline demographics age, sex and employment status were similar among cohorts. Significant differences were observed with respect to co-morbidities, glaucoma Rx adherence, and geographic region. Younger age (odds ratio (OR): 1.21; p<0.001), low Rx adherence (OR: 1.18; p<0.001), high co-morbid disease burden (OR: 1.12; p<0.006), and geographic region (OR: 1.50; p<0.001) significantly predicted use of LT. Of patients treated with LT, 60% did not have an Rx claim within 45 days after treatment; however by two years this proportion reduced to 22%. LT was associated with significantly higher medical ($2,684 vs. $1,980; p<0.001), lower pharmacy ($807 vs. $1,467; p<0.001), and higher overall costs ($3,441 vs. $3,408 p=0.002).

Conclusions: Poor Rx adherence, age, and number of comorbidities were predictors of receiving LT among OAG patients. Despite the potential for LT to address poor adherence, most patients had a claim for an Rx within two years after LT. Overall healthcare costs were greater among persons receiving LT compared to Rx therapy.

Commercial Relationships: Neil M. Schultz, Allergan, Inc. (F); William Wong, Allergan, Inc. (E); Anne L. Coleman, Allergan, Inc. (R); Daniel C. Malone, None
Support: Neil Schultz is a post-doctoral fellow and graduate student at the University of Arizona and Allergan

Program Number: 2128 Poster Board Number: A0047
Presentation Time: 3:45 PM–5:30 PM
Convergence of Societal Costs of Glaucoma Lasers From a Multicenter Randomized Clinical Trial
William G. Hodge, Omar Akhtar, Janet Martin, Greg Zaric. Ivey Eye Institute, University of Western Ontario, London, ON, Canada.

Purpose: For cost-effectiveness analyses (CEA) of glaucoma interventions to be of use they require valid and accurate cost and
effectiveness data. Costs remain understudied relative to effectiveness and the impact of cost estimation methods on resultant estimates is unknown in glaucoma. Direct measurement of costs is labour-intensive and expensive. Decision-analytic modelling of costs using literature sources, expert opinion and assumptions provides a quicker, less laborious alternative to empirical costing. A lack of long-term effectiveness data in chronic diseases like glaucoma means that modelling is widespread and inevitable, both for CEAs and budget impact projections. The same problem precludes validation of models and there are concerns about their validity and possible arbitrariness given the discretionary nature of their construction. In this thesis we investigate whether costs from a decision-analytic model of repeat laser trabecuoplasty among glaucoma patients provide a valid alternative to direct measurement of costs alongside an effectiveness trial.

Methods: Trial-based costing was conducted as part of an effectiveness trial comparing argon- and selective-laser trabecuoplasty (ALT and SLT) after previous SLT among glaucoma patients at an ophthalmologic clinic in Ontario. For model-based costing a decision tree was formulated and populated with parameter estimates based on previous literature supplemented with assumptions. Mean trial and model cost were compared for ALT and SLT from the societal perspective including indirect costs.

Results: Model and trial cost estimates differed minimally from the societal perspective (ALT: 1057C$ vs 1147C$, SLT: 1154C$ vs 1141C$ – this in spite of large differences in modelled and observed parameter values. These results were robust with sensitivity analysis. Labour accounted for the largest fraction of total cost.

Conclusions: Our results indicate that modelled costs are an acceptable substitute for directly measured costs for some clinical scenarios in glaucoma.

Commercial Relationships: William G. Hodg, None; Omar Akhtar, None; Janet Martin, None; Greg Zaric, None

Support: CIHR

Program Number: 2129 Poster Board Number: A0048
Presentation Time: 3:45 PM–5:30 PM
Comparing Total and Disease-Related Healthcare Cost of Glaucoma Patients by Disease Severity: A Retrospective Claims Database Analysis

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Purpose: Little is known about the relationship between glaucoma severity and cost. Few studies characterize healthcare costs in glaucoma patients, and none have characterized glaucoma related costs by disease severity. In this study we performed a retrospective database analysis to characterize the total healthcare costs and disease related costs for open-angle glaucoma patients, using ICD-9 disease severity categories.

Methods: We analyzed a large US commercial claims database to identify patients 18 years and older with glaucoma occurring in 2011. Inclusion criteria included: two separate occurrences of any combination of open-angle glaucoma (ICD-9 codes 365.10 or 365.11); and presence of a glaucoma severity code in the 12 months before first diagnosis. Outcomes of interest were the total healthcare and glaucoma specific costs by disease severity for 12-months post-diagnosis. Generalized linear modeling (GLM) with adjustment for clinically relevant baseline characteristics was used to estimate the mean costs of the mild, moderate, and severe glaucoma categories for both total healthcare and glaucoma specific costs.

Results: 899 open-angle glaucoma patients were identified in 2011 who also had an ICD-9 glaucoma severity code (mild n= 542; moderate n= 271; severe n= 86). Glaucoma specific multivariable adjusted GLM results produced mean costs of: $470 (95% CI: $433, $508; p<0.001) for mild category, $625 (95% CI: $546, $703; p<0.001) for moderate category and $1,037 (95% CI: $781, $1,293; p<0.001) for severe glaucoma category. The multivariable adjusted mean total healthcare costs were $5,161 ($4,278, $6,043; p<0.001) for mild severity, $5,206 (95% CI: $4,151, $6,261; p<0.001) for moderate severity and $10,348 (95% CI: $5,144, $15,552; p=0.001) for severe glaucoma severity.

Conclusions: This study demonstrates that glaucoma specific costs and total healthcare costs increase with increasing severity of glaucoma amongst commercially insured patients.

Commercial Relationships: Tracy Yep, Allergan, Inc (F); Vaishali D. Patel, Allergan, Inc (E); Julia Slejko, None; Beth Devine, None
Support: University of Washington-Allergan Post-Doctoral Fellowship

Program Number: 2130 Poster Board Number: A0049
Presentation Time: 3:45 PM–5:30 PM
Projected long-term clinical, economic, falls and driving loss outcomes of brimonidine vs. timolol in a U.S. population of normal-tension glaucoma patients

William Wong1, Quan V. Doan2, Mark Halperin2, Jennifer Duryea2.
1Allergan, Inc., Irvine, CA; 2Outcome Insights, Inc., Westlake Village, CA.

Purpose: The Low Pressure Glaucoma Treatment Study (LoGTS) is the only study to demonstrate a potential neuroprotective effect with brimonidine (BR). Assuming that the results of LoGTS could be observed over longer time horizon, we modeled the potential impact of BR on clinical, economic, falls (FL) and driving loss (DL) outcomes in a population of normal tension glaucoma (NTG) patients in the U.S.

Methods: A population model was constructed to simulate the long-term outcomes of 3 treatment strategies for NTG: BR, timolol (TM), and no treatment (NT). Data on visual field progression (mean deviation (MD) change per year) from LoGTS (for BR and TM) and the Collaborative Normal Tension Glaucoma Study (CNTGS) (for NT) was used to project changes in MD over a patient’s lifetime. Cases of NTG and outcomes including bilateral vision impairment (BVI) (MD ≤ -16 dB), bilateral blindness (BB) (MD ≤ -22 dB), DL, FL and cost of blindness were linked to MD scores based on published literature. For each outcome, the number of cases and the time to outcome, with 95% simulation intervals (95% SI) were estimated. Scenario analyses were performed to assess uncertainty around modeling visual field progression.

Results: Among approximately 1.44 million persons with NTG, NT was estimated to result in 310,493 cases of BVI (95% SI: 146,405 – 572,638) and 127,810 cases of BB (95% SI: 45,100 – 256,496). BR treatment was estimated to reduce the number of cases of BVI by 211,520 (95% SI: 73,641 – 419,478) and BB by 107,785 (95% SI: 29,024 – 232,744). Compared to NT, the model predicted that BR may prolong the time until BVI by 2.0 years (95% SI: 0.7 – 4.2 years) per person and until BB by 0.9 years (95% SI: 0.2 – 2.0 years) per person. Small differences between BR vs. NT were estimated for the time until driving loss (~0.5 year) or a fall (~1 year). No substantial differences in any of the outcomes (for both number of cases and time until outcome) were estimated between TM and NT. Fewer cases of BB associated with BR treatment may produce savings in

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direct medical costs (vs. NT: $2.5 billion, 95% SI: $0.5-$5.6 billion; vs. TM: $2.4 billion, 95% SI: $0.4 – $5.5 billion).

Conclusions: In a U.S. population of NTG patients, BR has the potential to result in improved vision-related outcomes and cost savings while TM may result in similar outcomes and costs as NT.

Commercial Relationships: William Wong, Allergan (E); Quan V. Doan, Allergan (C); Mark Halperin, Allergan (C); Jennifer Duryea, Allergan (C)

Support: Allergan, Inc.

Program Number: 2131 Poster Board Number: A0050
Presentation Time: 3:45 PM–5:30 PM


Purpose: Generic medications are considered a cost efficient alternative for medical treatment of glaucoma. Prescribers may not be aware of the variability among prices of generic medications. Through a prospective, observational study, we hypothesize a significant cost difference among common generic glaucoma medications across various national pharmacy chains.

Methods: Data was collected from 5 national pharmacy chains (pharmacy A,B,C,D,E) after comprehensive inquiries were made over telephone and web data mining. Most commonly used generic medications were chosen: 1) Latanoprost, 2) Timolol, 3) Dorzolamide, 4) Timolol / dorzolamide fixed combination, 5) Brimonidine 0.15% and 6) Brimonidine 0.2%. Cash “out of pocket” prices were collected. Means, standard deviation, and range were calculated. ANOVA & Student T-Test were performed for comparisons.

Results: Range, mean, and standard deviation (SD) for the prices of 6 generic medications across 5 national pharmacy chains are shown in table 1. We found that the range of mean prices for the 6 generic medications ranged from $9.80 (Timolol) to $96.95 (Brimonidine 0.15%). Analysis of variance comparing the mean prices of medications showed statistical significance (P-value 1.45E-05). Mean cost of 6 generic medications was calculated for each pharmacy which ranged from $28.30 to $65.06. The cash cost difference between pharmacy with the lowest (D) and highest (B) mean prices was statistically significant (p=0.02). Latanoprost had the highest cost variability with a % difference of 464% between the cheapest and most expensive pharmacy chain. The medication with lowest variability was Brimonidine 0.15%, however across all pharmacies this medication was the most expensive options. Timolol 0.5% had the lowest cost and exhibited the least price variation.

Conclusions: When comparing generic topical glaucoma medication costs, we found statistically significant differences in prices. While generic medications can be a cost efficient method to treating glaucoma, out of pocket expense varied widely among 5 national pharmacy chains. Latanoprost had the greatest percent difference of 464%, between the lowest and highest prices with 5/6 medications exhibiting large % differences in prices that exceed 200%. Based on this analysis, prescribers should be aware of wide variations among generic medications costs which can influence affordability to patients.

<table>
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<tr>
<th>Medication</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Mean</th>
<th>Std dev</th>
<th>% difference</th>
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<tbody>
<tr>
<td>Latanoprost 0.005%</td>
<td>$26.84</td>
<td>$68.03</td>
<td>$90.99</td>
<td>$86.09</td>
<td>$93.92</td>
<td>$85.73</td>
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<tr>
<td>Timolol 0.3%</td>
<td>$4.00</td>
<td>$30.79</td>
<td>$8.99</td>
<td>$11.21</td>
<td>$4.00</td>
<td>$8.80</td>
<td>$4.90</td>
<td>120%</td>
</tr>
<tr>
<td>Dorzolamide 1%</td>
<td>$50.00</td>
<td>$80.00</td>
<td>$56.94</td>
<td>$18.79</td>
<td>$46.04</td>
<td>$46.35</td>
<td>$16.37</td>
<td>239%</td>
</tr>
<tr>
<td>Timolol/dorzolamide</td>
<td>$66.95</td>
<td>$100.00</td>
<td>$130.00</td>
<td>$19.00</td>
<td>$80.45</td>
<td>$79.81</td>
<td>$26.13</td>
<td>40%</td>
</tr>
<tr>
<td>Brimonidine 0.15%</td>
<td>$98.00</td>
<td>$105.00</td>
<td>$93.43</td>
<td>$93.51</td>
<td>$94.80</td>
<td>$94.95</td>
<td>$4.87</td>
<td>12%</td>
</tr>
<tr>
<td>Brimonidine 0.2%</td>
<td>$29.49</td>
<td>$39.00</td>
<td>$9.99</td>
<td>$8.22</td>
<td>$31.50</td>
<td>$13.24</td>
<td>$11.67</td>
<td>290%</td>
</tr>
</tbody>
</table>

Generic medications by pharmacy

Commercial Relationships: Eunmee Yook, None; Robert Fechtner, None; Albert Khouri, None

Program Number: 2132 Poster Board Number: A0051
Presentation Time: 3:45 PM–5:30 PM

Global Cost-Effectiveness of Correcting Near Vision Impairment Due to Uncorrected Presbyopia
Eric B. Papas1, 2, Nina Tahhan1, Tim R. Fricke1, David A. Wilson1, 2, Monica Jong1, Kovin S. Naidoo1, 2, Serge Resnikoff1, 2, Brien A. Holden1, 2
1Research & Development, Brien Holden Vision Institute, Sydney, NSW, Australia; 2School of Optometry & Vision Science, University of New South Wales, Sydney, NSW, Australia.

Purpose: To investigate the worldwide cost-effectiveness of interventions for uncorrected presbyopia

Methods: Cost-utility ratios (USS/Quality Adjusted Life Year [QALY]) were calculated for the correction of near vision impairment due to uncorrected presbyopia based on either a) comprehensive eye examination and care delivery by trained personnel or b) vision screening and supply of “ready-made” spectacles by non-specialized health workers. Utility values were obtained from existing literature and costs of service delivery estimated separately for each WHO sub-regional category. Affordability of treatment relative to GDP per capita was also calculated.

Results: Total global costs associated with correcting near vision impairment due to uncorrected presbyopia were estimated at $30.8 billion for the comprehensive eye care model and $14.5 billion for the screening model. Cost-utility ratios depend on geographical location, being higher in developed countries. Estimates for the comprehensive eye care delivery were, in general, about twice as high (range 76 to 426 /$QALY) as for the screening approach (range 45 to 136 /$QALY).

The cost per QALY gained was at least 10 times lower than the gross domestic product (GDP) per capita in all regions (range 10 - 173) and at least 30 times cheaper (range 30 - 518) than the accepted cost-effectiveness threshold of 3 times GDP per capita.

Conclusions: Alleviating near vision impairment is an extremely cost effective means of improving quality of life in all regions of the world, irrespective of the service delivery approach taken. In cost effectiveness terms, presbyopia correction offers better value than other interventions, such as cataract surgery, that are widely accepted to offer excellent performance in this respect.

Commercial Relationships: Eric B. Papas, None; Nina Tahhan, None; Tim R. Fricke, None; David A. Wilson, None; Monica Jong, None; Kovin S. Naidoo, None; Serge Resnikoff, None; Brien A. Holden, None

Program Number: 2133 Poster Board Number: A0052
Presentation Time: 3:45 PM–5:30 PM

The global burden of potential productivity loss from uncorrected presbyopia
David A. Wilson1, 2, Kevin D. Frick1, Kovin S. Naidoo1, 4, Brien A. Holden1, 2
1Brien Holden Vision Institute, Sydney, NSW, Australia; 2School of Optometry and Vision Science, University of New South Wales, Sydney, NSW, Australia; 3The Johns Hopkins Carey Business School, Johns Hopkins University, Baltimore, MD; 4African Vision Research Institute, University of KwaZulu Natal, Durban, South Africa.

Purpose: This study estimates the global burden of potential productivity lost due to uncorrected presbyopia.

Methods: Population data from the United States (US) Census Bureau were combined with the estimated presbyopia prevalence, age of onset, employment rate, per capita gross domestic product (GDP) in current US dollars, and near vision impairment disability weights.
Results: There were an estimated 1.272 million people with presbyopia worldwide in 2011. A total of 244 million people with uncorrected or under-corrected presbyopia among people under 50 years of age were associated with a potential productivity loss of US$11,023 million (0.016% of global GDP). Correcting presbyopia to the level achieved in Europe would reduce the burden to US$1,390 million (0.002% of global GDP). If all those under 65 years are assumed to be productive, the potential productivity loss would be $25,367 million or 0.037% of global GDP.

Conclusions: Even with conservative assumptions regarding the productive population, presbyopia is a considerable burden and correction would have a significant impact on productivity in lower income countries.

Commercial Relationships: David A. Wilson, None; Kevin D. Frick, None; Kovin S. Naido, None; Brian A. Holden, None

Program Number: 2134 Poster Board Number: A0053
Presentation Time: 3:45 PM–5:30 PM

Estimating the cost of visual impairment: initial results

Purpose: Vision loss can have a substantial human and economic impact on individuals and society that include disability, loss of productivity and reduction in quality of life. The purpose of this study was to estimate economic burden of visual impairment in Portugal.

Methods: A prevalence-based cost of illness approach was adopted to estimate costs of visual impairment. We estimated direct medical costs and indirect economic costs. Direct medical hospital costs were determined using a bottom up approach. For those meeting the inclusion criteria (visual acuity of 20/40 or 0.5decimal or worse in the better eye and/or visual field of less than 20deg) we estimated direct costs by collecting information from administrative records that included: physician’s office visits, emergency and outpatient visits. We developed a survey based in parts of the annotated cost questionnaire-HERU Discussion Paper N.03/01 (UK Working Party on Patient Costs) and the Service Receipt Inventory-European Version. Using the questionnaire that we developed, in face-to-face interviews, we collect direct medical expenditures supported by patients that included: costs with medical prescriptions, low vision aids and devices. With the same questionnaire we collected information for indirect costs calculations. Indirect costs were calculated by estimating the value of productivity losses including employment participation, absenteeism and caregiver costs.

Results: Results presented here correspond to 442 patients that met the inclusion criteria. The four main causes of visual impairment in this sample were Diabetic Retinopathy, Cataract, Glaucoma and Age-related macular degeneration. Direct medical hospital costs were accountable for 12% of total costs calculated. Patient expenditures represented 25% of expenses with visual impairment and indirect costs corresponded to 63% of the total. From this data we estimated that the average annual direct cost per patient with VI was 958 euro and average annual indirect cost was 1655 euro.

Conclusions: With the instruments and methodology that was adopted we were able quantify direct medical hospital costs as well as indirect costs of visual impairment. Results of this study show that more than half of the costs with VI are indirect. This highlights that particular attention should be given to costs that arise for individuals with vision loss.

Commercial Relationships: Ana P. Marques, None; Antonio F. Macedo, None; Amandio A. Rocha-Sousa, None; Antonio M. Baptista, None; Gary S. Rubin, None; Joel Monteiro, None; Laura Hernández_Moreno, None; Joana Cima, None; Rui Santana, None

Support: FCT (COMPETE/QREN) grant ref: PTDC/DPT-EPI/0412/2012

Program Number: 2135 Poster Board Number: A0054
Presentation Time: 3:45 PM–5:30 PM

Global Impact of NEI Funding: Research Directions and Potential Collaborations
Pamela C. Sieving, Gyan J. Prakash. 1Consultant, Bethesda, MD; 2National Eye Institute, Bethesda, MD.

Purpose: Analyze global reach and impact of National Eye Institute (NEI) funding, training and collaborative research programs; identify trends and potential research directions and collaboration using bibliometric tools.

Methods: We used Web of Science (WoS; Thomson Reuters) to identify publications in which at least one author’s address was outside the U.S., and for which ≥1 NEI grant was acknowledged, the National Eye Institute was identified as a funder or an NEI researcher was a co-author from 2008-2014. WoS analytics (publications/year; productivity/author, author institutions, funding agencies, journals) were analyzed. Citation counts and networks provide additional insights into the impact of NEI programs.

Results: 4834 papers met our criteria. Publications have increased steadily to >850/year. The number of author and papers/author has increased. In 2008, 47 wrote 3-8 papers each; in 2013,385 researchers authored ≥3. NEI staff are among the most-prolific (max. 61 papers by 1 author). The US contributed authors on 92% of the papers, but a total of 100 countries contributed. China (970), Germany (739), Canada (529), Japan (465), Australia (407), and the UK (479) lead; 32 countries were represented on 1-3 papers. The WoS algorithm classified 29% as “ophthalmology,” 18% as neurosciences, and 5% as genetics, the trend is to decreasing ophthalmology and increasing basic science. ≥500 journals published these papers. 9.5% appear in IOVS; 10 of the top-25 journals are vision-related titles, together publishing 23%. 603 agencies funded ≥5 papers each. The highest-cited paper (>2080 citations) was funded by >25 agencies in 8 countries, with authors from11. In addition to NEI, 17 NIH institutes provided grant support. Institutional affiliations include many NIH staff (>1300 papers).

Conclusions: In 1995, NEI explicitly acknowledged the importance of collaboration between the NEI and researchers around the world. NEI now supports ≥25 grants and 35 sites in 15 countries. Our findings demonstrate global impact, with NEI support producing publications increasing from 47 countries in 2008 to 75 in 2014, totaling 100. More than 750 (15.5%) papers have been cited at least 25 times; ≥2850 have been cited at least 5 times, and average citations/paper=15.54.

Commercial Relationships: Pamela C. Sieving, None; Gyan J. Prakash, None

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Impact of the Affordable Health Care Act on No-Show Rates and Demographics of Patients Presenting for Eye Care in an Underserved Inner City Population.

**Purpose:** Patients in underserved areas face substantial barriers to access to health care, especially due to lack of insurance and as a result of high no-show rates. In this study we set out to determine if the implementation of the Affordable Health Care Act (AHCA) affected no-show rates and access to eye care services in an underserved inner city population.

**Methods:** A retrospective cohort study compared the demographics (age, sex, gender, self-described ethnicity) and no-show rates of patients seen at an inner city public hospital eye clinic, between 2 time periods: 1/2012-12/2013 (pre-AHCA) and 1/2014-9/2014 (post-AHCA). Pre- and post-AHCA demographics and no show rates were compared using t-test. The changes in payer mix (including self-pay, commercial, medicaid, medicare, HHC insurances), pre- and post-AHCA, were analyzed using Chi Square analysis.

**Results:** A total of 7582 patients were seen in the pre-AHCA time frame, and 7201 patients were seen post AHCA. The average patient age was 53±4.0 years pre-AHCA and 54±4.2 years post-AHCA (p=0.05). The gender distribution of patients seen pre-AHCA (Females 61.3%, Males 38.7%) was similar to those seen post-AHCA (females 60.4%, males 39.7%). In both the pre- and post-AHCA period, Hispanic patients comprised the majority of the clinic population (48.3% vs 46.1%; p=0.12). African Americans were the second majority (27.9% vs 27.7%; p=0.86). Significantly more Caucasians (7.5% vs 9.4%; p=0.0001) and significantly less Hispanic Blacks (3.68% vs 3.04%; p=0.04) were seen post-AHCA. The changes in payer mix for pre- and post-AHCA were as follows: self-pay (0.9 vs 1.7%; p=0.00); commercial insurance (3.8% vs 4.5%; p=0.026); HHC Options (39.5% vs 38.5%; p=0.23); Medicaid managed care (28.7% vs 28.1%; p=0.42); Medicare managed care (14.4% vs 14.6%; p=0.77); Medicare (7.2% vs 7.0%; p=0.65); and Medicaid (3.4% vs 3.9%; p=0.97). The no-show rates for pre- and post-AHCA were similar, 39±8.8% and 42±10.4% (p=0.79%)

**Conclusions:** With the passage of AHCA, more Caucasian patients and less Hispanic Black patients sought eye care. As expected, the proportion of commercial insurances presenting to the hospital increased, but surprisingly the proportion of self-pay patients increased. No-show rates have not been impacted by the AHCA and remain high, presenting a significant challenge to access to care.

**Commercial Relationships:** Paul J. Lee, None; Gary Oliver, None; Ann Ostrovsky, None

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Classification of Ophthalmology Utilization Pattern CMS Data Using K-Means Clustering Algorithm

**Purpose:** The purpose of the project is to visually depict the utilization pattern for various procedure codes contained in the CMS data for year 2012 released in 2014. Utilization analysis is a significant topic in health care due to the rising healthcare cost and the need for resource allocation. In this environment, physicians are being profiled with increasingly sophisticated algorithms. Advances made in the field of data analytics can be used to proactively perform such analysis by physicians.

**Methods:** K-means clustering algorithm was applied to the CMS dataset which was was stored in a MYSQL database. A query interface was created utilizing PHP, MYSQL and various JAVASCRIPT libraries including Jquery, Bootstrap and Angular. The user was presented with a list of Ophthalmology codes from which a dataset could be downloaded in .csv format. In order to determine the number of clusters present, a scatter plot was performed utilizing R statistical software package. The “elbow” of the plot was determined and utilized as the starting point for the k-means clustering algorithm. This dataset was then presented graphically using scatter plot along with plotting of the mean and median. The parameters examined evaluated raw number of procedures, raw number of patients and the ratio of treatments per patient. This technique was applied to intravitreal injections given its financial and health impact on the society. However, it can be applied to any code present in the dataset.

**Results:** The results demonstrated a two clustered group based on the scatter plot. The distribution of the procedure quantity was distributed with a power law distribution with the distribution plot showing significant outliers. The treatment ratio demonstrated a normal distribution. Correlation test demonstrated a correlation between number of treatments and number of patients. However, no other correlations were seen.

**Conclusions:** Significant variation exists in the utilization pattern. No significant correlation was seen except between the number of treatments vs. number of patients. This study was a demonstration of a technique for analyzing utilization data. As such, the portal created to perform this task as well as the initial description of a code was successful.

**Commercial Relationships:** Paul J. Lee, None

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Impact of the Affordable Health Care Act on Demographics and Visual Acuities of Patients Presenting For Cataract Extraction in an Underserved Urban Population

**Purpose:** Insurance coverage under the Affordable Health Care Act (AHCA) took effect January 1st, 2014. We herein examined the impact of the AHCA on demographic characteristics and vision at presentation for cataract surgery in an underserved inner city population. Vision at presentation is utilized as a marker for access to ophthalmic care, assuming that patients with better access to care will seek care earlier.

**Methods:** A retrospective chart review was performed for all patients who presented for cataract surgery at a city hospital in Brooklyn, New York between July 2012 and October 2014. Gender, self-described ethnicity, age, and best-corrected visual acuity (BCVA in LogMar) at presentation for cataract surgery evaluation were extracted. All variables studied before (pre-AHCA) and after (post-AHCA) January 1, 2014 were compared with T-test and Chi Square-Test.

**Results:** 375 patients were included. There were 275 patients in the pre-AHCA group and 100 in the post-AHCA group. In both groups, there was a higher percentage of females to males (58.5% females vs 41.5% males pre-AHCA (p=0.02); and 67% females vs 33% males (p=0.01) post-AHCA). No significant changes in distribution of the sexes was found post-AHCA as compared to pre-AHCA (p=0.31).
Average age was 66.6±10.7 years pre-AHCA and 66.1±9.4 years post-AHCA (p=0.76). The ethnic makeup of the two groups was similar and the most populous ethnic groups pre- vs post- AHCA were Hispanic 51.2% vs 49% (p=0.84), Caucasian 8.8% vs 14% (p=0.18), and African 27.4% vs 26% (p=0.84). Subgroup analyses revealed no significant difference between microbes on presentation drops £60 (£1.44-£235.33). Age and LOS showed no correlation (r=1.0, p<0.0001). Median cost of LOS (days) median 7. COA: Median £4362.94 (£1968-£29,676).

Most common pathogens on presentation were: G.Gentamicin 26(36.1%), G.Cefuroxime 18(27.8%), and G.Cefuroxime 22(30.6%) and G.Gentamicin in 7(9.7%). Most on admission were: G.Ofloxacin 40(55.6%), G.Penicillin 25(34.8%), and G.Streptococcus 16(22.2%). The most commonly prescribed antibiotics positive bacterial infections: 40(55.6%), gram positive 22(55%), gram negative 18(45%). The most commonly prescribed antibiotics positive fungal infections were: G.Fungi 18(45%), G.Penicillin 25(34.8%), and G.Cefuroxime 22(30.6%) and G.Gentamicin in 7(9.7%). Most common antibiotics used against fungal infections were: G.Gentamicin 26(36.1%), G.Cefuroxime 18(27.8%), G.Ofloxacin 14(20.8%), G.Penicillin 14(20.8%).

Conclusions: These results echo the importance of a validated robust data capturing tool for essential epidemiological data. An incorporated cost analysis is vital to capture data for resource focus and enforcing effective and efficient practice. Having determined parameter fields in this study, we are developing a web-based input form for national data capture.

Commercial Relationships: George Moussa, None; Jasvir Virdee, None; Mrinal Rana, None; Saaeha Rauz, None

Program Number: 2140 Poster Board Number: A0059
Presentation Time: 3:45 PM–5:30 PM
Cost-Analysis of Diagnostic Testing Modalities in a New Uveitis Patient Work-Up
Sameet K. Gupta1, Asima Baijwa1, Tanya Wancheck2, Ashvini Reddy1. 1Department of Ophthalmology, University of Virginia, Charlottesville, VA; 2Department of Public Health Sciences, University of Virginia, Charlottesville, VA.

Purpose: Investigational testing can aid clinicians in the etiological diagnosis of uveitis. However, commonly performed batteries of tests can be costly and non-specific. The purpose of this study was to evaluate commonly ordered studies for the work-up of a patient presenting to the ophthalmologist with uveitis and determine the diagnostic value of these tests in an incremental cost perspective.

Methods: This analysis was conducted by performing a current literature search of both infectious and inflammatory causes of uveitis for epidemiological data, including disease prevalence in the United States, laboratory testing for each disease entity ordered at the University of Virginia Department of Ophthalmology, sensitivity and specificity data for each available test, positive and negative predictive values of studies, pretest probability for disease, and Medicare and Medicaid costs and provider reimbursements for the state of Virginia. A revised Bayes' theorem statistical analysis utilizing TreeAge software was performed to determine cost effectiveness ratios for each test, further grouped by diagnosis.

Etiologies were ranked using cost-effectiveness units (CEU), with lower values indicating a more cost-effective test. Diagnoses involving more than one applicable test were ranked by an average cost-effectiveness.

Results: A total of 16 diagnoses were considered for this analysis. The average cost effectiveness for each diagnosis was determined and the diagnoses were ranked by most cost-effective to exclude. This revealed that completing the evaluation in a step-wise manner resulted in the most effective use of resources. For Medicare patients, Rheumatoid arthritis was the most effective first diagnostic evaluation, with an average cost effectiveness of 10.4 CEU. Subsequently, this was followed by syphilis (14.5 CEU), bartonella infection (15.6 CEU), granulomatosis with polyangiitis (Wegener's Granulomatosis) (18.1 CEU), and Polyarteritis Nodosa (19.0CEU).

Conclusions: Due to the broad differential of causes of uveitis, diagnostic testing by the ophthalmologist can be useful in determining an etiology. However, full batteries of studies are often non-specific and costly to perform. Conducting diagnostic testing using a pre-determined algorithm can aid the ophthalmologist in arriving at a diagnosis within resource constraints.
Stargardt Disease – A patient’s journey across the world

Catherine Brun-Strang1,2, Ronald Buggage3, Majorie Leclerc3, Genevieve Bonnelye3, Tanya Wancheck, Ashvini Reddy, None; Bajwa V, None; Sumeet K. Gupta, None; Charisse K. Kho, None.

Program Number: 2141 Poster Board Number: A0060
Presentation Time: 3:45 PM–5:30 PM
Stargardt Disease: burden from a patient association perspective.

Commercial Relationships: Sumeet K. Gupta, None; Asima Bajwa, None; Tanya Wancheck, None; Ashvini Reddy, None

Purpose: Stargardt Disease (SD), caused ABCA4 gene mutations, is the most prevalent juvenile-onset inherited retinal disease. As SD is rare (estimated prevalence 1/10,000) with no approved treatment, we sought to better understand the patient journey from disease onset to clinical diagnosis and management across the world.

Methods: We conducted 18 in-depth 60-minutes interviews (IDIs) among representatives from patient associations (RPAs) focusing on SD disease and having SD patients, patients’ family or relatives as members in 18 countries. IDIs moderation was based on a semi-directive guide. All IDIs were audio-recorded and the data collected was analyzed descriptively following a common analysis grid.

Results: Preliminary data analysis based on 22 clinicians/researchers and 10 representatives of patients association, IDIs conducted in France, Germany, Italy, Spain, Argentina, Brazil, Mexico, Colombia, Chile, Venezuela, USA, and Canada showed variability in the delay between the time of symptoms onset and diagnosis. The average delay is 6-12 months in Europe, 1-2 years in North America and 5-6 years in Asia and Latin America. The differences are mainly due to low disease awareness, particularly among general practitioners/pediatricians, and delayed access to specialists often attributed to costs and geographical distance. No SD guidelines are currently available and few therapeutic strategies are in place. Clinical diagnosis is based on funduscropy, visual field, OCT, ERG and family history. Confirmatory genotyping is systematically proposed in France, Germany, Italy, and North America with about 85% of patients tested. The percentage of genotyped patients drops to 30% in China, Mexico and Spain and 10% in Brazil, Argentina and Malaysia. No genotyping is performed in the remaining countries, being considered neither a priority nor required for diagnosis. Additional barriers to genotyping include cost and lab access.

Conclusions: SD patients experience different patient journeys. The variable presentation of the disease, accessibility to specialists and costs also impact these differences. Genotyping for SD is not considered a priority in many countries. The availability of an effective therapy, consensus guidelines including recommendations for genotyping, and raising awareness would reduce delays to diagnosis and help to harmonize the management of SD patients across the globe.

Commercial Relationships: Ronald Buggage, Sanofi (E); Majorie Leclerc, Kantar Health (E); Genevieve Bonnelye, Kantar Health (E); Catherine Brun-Strang, Sanofi (E)

Program Number: 2142 Poster Board Number: A0061
Presentation Time: 3:45 PM–5:30 PM
Stargardt Disease: burden from a patient association perspective.

Commercial Relationships: Catherine Brun-Strang, Sanofi (E); Genevieve Bonnelye, Majorie Leclerc, Ronald Buggage, R&D HEOR, Sanofi, Paris, France; Kantar-Health, Montrouge, France; Ophthalmology Unit, Paris, France. Therefore associations provide psychological support, counseling on medical results and medical orientation to prevent patients from isolating themselves. They also inform patients about ongoing research and on treatments in development. While the cost of SD was perceived to be a burden to patients, the magnitude of the economic burden was difficult to estimate by RPAs.

Conclusions: From the patient association perspective, the main areas of impact of SD on patients are adapting to daily-life and maintaining autonomy. The support offered by patient associations, beyond that addressed routinely in clinic practice, can help to relieve the burden of SD. As important allies in the global management of visually impaired persons participation in patient associations should be recommended for all patients with inherited retinal diseases such as SD.

Commercial Relationships: Catherine Brun-Strang, Sanofi (E); Genevieve Bonnelye, Kantar Health (E); Majorie Leclerc, Kantar-Health (E); Ronald Buggage, Sanofi (E)
**Central Retinal Vein Occlusion**

Peter A. Karth, Darius M. Moshefghi, Mark S. Blumenkrantz. Ophthalmology, Stanford University, Palo Alto, CA.

**Purpose:** To present the relative costs of intravitreal aflibercept, ranibizumab, bevacizumab, dexamethasone implant and triamcinolone for treatment of macular edema due to central retinal vein occlusion (CRVO), correlate the costs of gains in visual acuity, and determine the utility of those gains.

**Methods:** Data from relevant randomized clinical trials were analyzed. Visual acuity results and treatment protocols were obtained from several large published clinical trials focused on macular edema due to CRVO treated with the above agents versus natural history. The cost of one year of treatment was calculated with the trial protocols and a more clinically relevant modified protocol. The utility of the visual improvement was determined, including area-under-the-curve analysis. The cost for the gain in visual acuity and the increase in utility was calculated, resulting in quality-adjusted life year (QALY) outcomes for each medication.

**Results:** In all scenarios presented, bevacizumab provided the most economical treatment of macular edema due to CRVO by a large margin (as much as 84%). Intravitreal triamcinolone proved to be the next most economical, however this treatment offered the lowest total utility improvement. Aflibercept, ranibizumab, and dexamethasone implant provided similar cost per utility unit gained, however dexamethasone implant provided the least total utility improvement of these three and highest cost per QALY (up to $28,844, adjusted). Within the anti-vascular endothelial growth factor class, which provided similar and significant utility gains, cost savings between the most expensive (ranibizumab; $20,640) and the least expensive (bevacizumab; $3,298) medication was as much as an 84%, adjusted for utility yields. Medication costs alone range from less than 1% to 78.6% of total treatment cost.

**Conclusions:** Now that clinical trial is available on a number of different treatment strategies for macular edema due to CRVO with similar treatment criteria, it is possible to perform an analysis of costs and benefits, including utility gained by patients, of each modality that can then be used when assessing treatment option. In our analysis, bevacizumab offers significant cost-utility and QALY advantages over other treatments.

**STUDY PROTOCOLS**

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**Study Groups:** Group I, Group II, Group III

**Commercial Relationships:** Peter A. Karth, None; Darius M. Moshefghi, None; Mark S. Blumenkrantz, None

**Program Number:** 2144 Poster Board Number: A0063

**Presentation Time:** 3:45 PM–5:30 PM

**Effect of Initial Visual Acuity on Cost of Diabetic Macular Edema Treatment**

Deepthi M. Reddy1,2, Richard M. Feist1,2, Richard M. Feist1, John O. Mason1,2, Richard A. Albert1,2, Martin L. Thomley1,2, Claudia Ayala2,3, John O. Mason, None; Richard M. Feist, None; Martin L. Thomley, None; Claudia Ayala, None

**Purpose:** To evaluate the effect of visual acuity on the overall cost of diabetic macular edema treatment before and during the era of anti-vascular endothelial growth factor (anti-VEGF) therapy.

**Methods:** A retrospective study was performed of two groups with clinically significant diabetic macular edema, who began treatment 10 years and 3 years ago, before and after the introduction of anti-VEGF therapy. Patients were stratified into subgroups with entry visual acuity better than 20/40 or 20/40 or worse. Treatment cost for each group and subgroup was calculated using current fee schedules for Medicare and the predominant private insurance carrier for the state of treatment (Alabama).

**Results:** The 10 year group received solely laser photocoagulation treatment while the 3 year group received both anti-VEGF and laser photocoagulation. Overall, the 3 year group had better visual retention during 2 years of follow up (mean logMAR of visual loss 0.03 versus 0.22, p=0.0029) at 2 years follow up) and a higher mean treatment cost. In the subgroup with 20/40 or worse vision, overall treatment costs ranged from 40% to 45% higher in the 3 year group and only 3% higher in the 10 year group.

**Conclusions:** Anti-VEGF treatment offers better visual prognosis in clinically significant diabetic macular edema but with a higher cost of treatment. Worse initial visual acuity may incur a higher cost of treatment.

**Commercial Relationships:** Deepthi M. Reddy, None; Richard M. Feist, None; Richard M. Feist, None; John O. Mason, None; Richard A. Albert, None; Martin L. Thomley, None; Claudia Ayala, None

**Program Number:** 2144 Poster Board Number: A0063

**Presentation Time:** 3:45 PM–5:30 PM

**Comorbidity and Healthcare Visit Burden in Elderly Diabetic Macular Edema Patients**

Joanna Campbell1, Pravin U. Dugel2, Ashley Cole3, Orsolya Lunacek4, Amanda Forrys2, Herman Chou1, Hitesh Chandwani3, Szilard Kiss3, 1GHOSR, Allergan, Irvine, CA; 2Retinal Associates of Arizona, Phoenix, AZ; 3Xcenda, Palm Harbor, FL; 4CHDA, Allergan Inc, Irvine, CA; 5Ophthalmology, Weill Cornell Medical College, New York, NY.

**Purpose:** Treatment for diabetic macular edema (DME) is only one component of the total healthcare burden faced by DME patients, who typically have longstanding diabetic disease. The total healthcare burden of DME patients has recently become a topic of interest. This study assesses comorbidity rates and healthcare use in elderly diabetics with DME compared to those without DME.

**Methods:** A retrospective matched cohort study of DME patients vs. diabetics without DME was conducted using the Centers for Medicare and Medicaid Services 5% Standard Analytic Files. DME cases (≥68 years of age) with their first (index) diagnosis of DME (ICD-9-CM 362.07), and non-DME controls with a diagnosis of diabetes (ICD-9-CM 250.xx) and no DME, were identified between 07/01/2010 and 12/31/2011. Both cohorts required continuous enrollment for 30 months pre-index and 12 months post-index. Cases and controls were matched 1:3 on age at index (±2 years), gender, region, and index year. Rates of diabetes-related comorbidities and mean annual healthcare visits per utilizing patient 12 months post-index were compared between cohorts with chi-square tests and Wilcoxon rank sum tests, respectively.

**Results:** There were 889 DME cases matched to 2,667 non-DME controls. The proportion of cases with all diabetes-related comorbidities assessed (myocardial infarction, congestive heart failure, peripheral vascular disease, cerebrovascular disease, stroke, renal disease, lower limb amputation) was significantly higher than for controls (p< 0.05 for all). Compared to controls, DME patients
had significantly higher total healthcare visit days (46.5 vs 34.5, p<0.001), primarily driven by differences in outpatient visits (31.2 vs 23.5, p<0.001) [Fig 1]. Eyecare-related visits were also significantly higher in the DME cases, but were a small proportion of overall healthcare utilization (4.5 vs 1.7, p<0.001) [Fig 1].

**Conclusions:** DME patients have a significant health care burden over diabetics without DME; therefore, intensive treatments that could increase utilization with health care professionals may not be feasible. Treatments that require less frequent dosing may benefit this population.

**Results:** There were 4,006 eligible DME cases with a matched control cohort of 12,018 non-DME diabetics. The proportion of cases with diabetes related comorbidities (myocardial infarction, congestive heart failure, peripheral vascular disease, cerebrovascular disease, stroke, renal disease, lower limb amputation) in the post-index period was significantly higher than the proportion of controls (p<0.001 for all). Compared to the control group, on average, the DME cohort had significantly higher total healthcare visit days (28.6 vs. 16.9, p<0.001) [Fig 1], primarily driven by differences in outpatient visits (27.0 vs. 16.1, p<0.001). Eye-care related visits were also significantly higher in the DME cases, but were a small proportion of overall healthcare utilization (5.1 vs. 1.5, p<0.001) [Fig 1].

**Conclusions:** Our analysis reveals a significant comorbidity and healthcare utilization burden for the working-age DME population compared to diabetes without macular edema. The burden of ~30 healthcare visits in a year is especially challenging in this working-age population, and might present a choice between seeking treatment and going to work.

Fig. 1. Mean Annual Healthcare Utilization (Per Utilizing Patient) 12 Months Post-Inde

**Commercial Relationships:** Joanna Campbell, Allergan Inc (E); Pravin U. Dugel, Alcon (C), Alimera (I), Allergan Inc (C), Annidis (C), Digisight (I), Genentech (C), Ophthotech (I), Thrombogenics (C); Ashley Cole, Allergan Inc (E); Orsolya Lunacek, Allergan Inc (C); Amanda Forys, Allergan Inc (C); Herman Chen, Allergan Inc (C); Hitesh Chandwani, Allergan Inc (E); Szilard Kiss, Alimera (C), Alimera (R), Allergan Inc (F), Allergan Inc (R), Genentech (C), Genentech (F), Genentech (R), Regeneron (C), Regeneron (F), Regeneron (R)

**Support:** Study funded by Allergan Inc

**Program Number:** 2146 **Poster Board Number:** A0065

**Presentation Time:** 3:45 PM–5:30 PM

**Comorbidity and healthcare visit burden in working-age commercially insured diabetic macular edema patients**

Hitesh Chandwani, 1 Szilard Kiss, 2 Ashley Cole, 3 Vaishali D. Patel, 4 Orsolya Lunacek, 5 Pravin U. Dugel 5. 1CHDA, Allergan, Inc., Irvine, CA; 2GHOSR, Allergan, Inc., Irvine, CA; 3Amerisource Bergen, Palm Harbor, FL; 4Retinal Consultants of AZ, Ltd., Phoenix, AZ; 5GHOSR, Allergan, Inc., Irvine, CA

**Purpose:** Treatment and follow-up of diabetic macular edema (DME) is only one component of the total healthcare burden faced by DME patients, who typically have longstanding diabetic disease. The total healthcare burden of DME patients has not been studied extensively. The purpose of this study was to assess the comorbidity burden and healthcare resource utilization among working-age diabetics with DME compared to those without DME.

**Methods:** A retrospective matched cohort study of DME patients vs diabetics without DME was conducted using the MarketScan® Commercial Claims and Encounters Database. Eligible adult (18-63 years of age) cases were required to have the first (index) DME (ICD-9-CM code 362.07) claim between 01/01/2011 and 06/30/2012, with continuous enrollment in the pre-index (30 months) as well as post-index (12 months) periods. The controls included diabetic patients without DME. Cases and controls were matched 1:3 on age at index date (±2 years), gender, region, and index year. Rates of diabetes-related comorbidities and mean annual healthcare visits per utilizing patient in the 12 months post-index were compared between cohorts.

**Conclusions:** Our analysis reveals a significant comorbidity and healthcare utilization burden for the working-age DME population compared to diabetes without macular edema. The burden of ~30 healthcare visits in a year is especially challenging in this working-age population, and might present a choice between seeking treatment and going to work.
Analysis of Malpractice Claims Filed Against Retina Specialists Based on Practice Location: Is There a Litigious Trend?
Kelly Laurenti, Judy E. Kim. Ophthalmology, Medical College of Wisconsin, Milwaukee, WI.

Purpose: Previous studies suggest that fear of litigation may influence medical decision-making by some physicians. One factor that may influence a physician is the litigious tendency in the region of practice, while the other may be the specialty of medicine. Vitreoretinal specialists and diseases related to retina may be especially susceptible to litigation as retinal conditions tend to be emergent and many may result in severe and permanent vision loss. We reviewed malpractice claims associated with diseases and surgeries related to the retina and compared the medicolegal outcomes among the various states of the insured retina specialists.

Methods: Closed claims data from an ophthalmic insurance company that has insured in all states except Wisconsin for a 10-year period between 2003 and 2012 were reviewed. Claims filed against retina specialists were identified and outcomes were analyzed and compared based on the individual states of the retina specialists.

Results: During the 10-year period, there were 2,246 closed claims and 344 (15.3%) were related to retina related claims (RRC). Of the 344 RRC, 42 (12.2%) resulted in indemnity payments totaling $11,587,732 (mean = $275,898, median = $150,000). RRC arose in 36 of 49 states. The top 5 states with the most RRC were California (72), Florida (40), Texas (36), Michigan (27), and Louisiana (20) and accounted for 57% of all RRC. There were a total of 5,426 insured years of retina specialists (RSIY). Top 5 states with the most number of RSIY were Florida (542), California (523), Texas (437), Illinois (390), and Virginia (382). Relative risk for claims was estimated by dividing the number of RRC by RSIY for each state. The top 5 states with the highest risk for claims were Mississippi (0.500), Kansas (0.400), Rhode Island (0.300), Indiana (0.25), and Idaho (0.192).

Conclusions: States with the most number of RRC tended to have the highest number of insured years by retina specialists and 5 states accounted for the majority of RRC. However, when relative risk for claims was assessed, the top 5 states were not the states with highest number of RRC, but rather from states with few claims resulting from few retina specialists. However, most claims did not result in indemnity payments.

Commercial Relationships: Kelly Laurenti, None; Judy E. Kim, None