**PRS3**

### A VALIDATION STUDY ON USING MORTALITY RISK STRATIFICATION TOOL TO STRATIFY ECONOMIC RISK IN PATIENTS WITH ACUTE EXACERBATION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE (AECOPD)

Tabak YP[1], Sun X[1], Johannes RS[1], Gupta V[1], Darin R[1], Shorr AF[2]
[1]Cardinal Health, Marlborough, MA, USA, [2]Washington Hospital Center, Washington, DC, USA

**OBJECTIVES:** AECOPD is a leading cause of hospitalization. A valid and easy-to-use risk stratification tool applicable not only for clinical but also economic outcomes would facilitate population-based outcome studies. We sought to validate an AECOPD clinical risk stratification tool previously reported and determine its utility for economic outcomes. **METHODS:** We analyzed 57,791 AECOPD admissions in 2004–2005 across 191 USA hospitals. The AECOPD risk stratification tool identified three factors with the highest discrimination of mortality risk: BUN > 25 mg/dl, Altered mental status, and Pulse > 109 per minute (BAP). Based on the number of risk factors present on admission, the BAP classified patients into four risk categories, ranging from Low (0 risk factors) to High (3 factors). We examined mortality, length of stay (LOS), and cost outcomes using the BAP classification algorithm. The cost outcome was calculated using the Centers for Medicare and Medicaid Services (CMS) cost/charge ratio for each hospital for a given calendar year. **RESULTS:** Overall, median age was 72 (IQR: 63–79) and 55% were women. Crude mortality was 2.4%. The prevalence for each of the BAP risk categories was 51.6% (low), 39.7% (Intermediate I), 7.9% (Intermediate II), and 0.8% (High). The corresponding mortality was 1.0%, 2.7%, 8.2%, 17.6%; the mean LOS was 4.7, 5.4, 6.6, 6.8 days; the mean cost were $5,700, $6,900, $9,400, $11,400 respectively. The trend-analyses revealed a graded association between number of BAP risk factors and worsening outcomes. For every addition of BAP risk factors, there was an exponential increase in mortality risk (OR: 2.89, CI: 2.70–3.09), 0.81 day increase of LOS (CI: 0.76–0.87), and $1600 increase of cost (CI: $1500–$1700). P-values for all trends were <0.0001. **CONCLUSIONS:** The BAP classification tool accurately differentiates mortality risk. It may also be used to identify high risk cohorts for prolonged LOS and excess cost among hospitalized AECOPD patients.

**PRS4**

### PROGNOSTIC FACTORS OF PATIENTS TRANSFERRED TO CHRONIC RESPIRATORY CARE WARD

Hung MC[1], Yan YH[2], Lin MS[3], Chen CR[3], Wang JD[4]
[1]National Taiwan University and National Taiwan University Hospital, Taipei, Taiwan, [2]National Taiwan University and Chia-Yi Christian Hospital, Chiayi City, Taiwan, [3]Chia-Yi Christian Hospital, Chiayi, Taiwan, [4]National Taiwan University, Taipei, Taiwan

**OBJECTIVE:** To determine factors predictive to survival for patients transferred to respiratory care ward after prolonged mechanical ventilation. **METHODS:** We reviewed medical records in a hospital in southern Taiwan between January 1, 2003 and December 31, 2006 to collect clinical data while transferred to respiratory care ward. The National death certification database of Taiwan was linked to ascertain the date of death. Kaplan-Meier estimation was performed for survival analysis; Cox proportional hazards model was constructed based on various patient characteristics, including age, gender, education, co-morbidity with diabetes, stroke, chronic obstructive pulmonary disease, end stage renal disease and blood platelet. A strategy of backward selection was taken. **RESULTS:** Two hundred and eighty-seven patients who required chronic mechanical ventilation in intensive care unit were included in this study. Their median age was 77 years, 56% were male. Survival rate of 90 days and 180 days following transfer to respiratory care ward were 70 and 50%, respectively. After taking age, gender, and various co-morbidity into consideration, the adjusted hazard ratios for end stage renal disease and abnormal blood platelet count were 1.56 (95% confidence interval (CI), 1.12–2.15) and 1.40 (95%CI, 1.04–1.90), respectively. **CONCLUSION:** Overall survival of patients with prolonged mechanical ventilation was poor, especially for patients with end stage renal disease or/and abnormal blood platelet count.

**PRS5**

### IMPACT OF TOBACCO SMOKE EXPOSURE ON EXACERBATION FREQUENCY, SEVERITY, AND INHALER USE IN ASTHMATIC CHILDREN

Everett BL, Hong SH
University of Tennessee Health Science Center, Memphis, TN, USA

**OBJECTIVE:** Each year, asthma accounts for 3 million clinic visits, 550,000 emergency room visits, 150,000 hospitalizations, and 150 deaths in children under fifteen. Literature suggests that asthmatic children exposed to tobacco smoke experience complications of greater frequency and severity than those unexposed. This study proposes to test the hypotheses that asthmatic children exposed to household tobacco smoke experience more frequent and severe exacerbations and have greater inhaler use than those unexposed. **METHODS:** NHANES' 2003–2004 database was queried to identify a cohort of 421 asthmatic children (ages 0–17) with current diagnosis of asthma and complete demographic, examination, and questionnaire data. The cohort was analyzed based on exposure to household tobacco smoke. Logistic regression was used to examine emergency room (ER) visit, wheezing frequency, and recent inhaler use. **RESULTS:** Results revealed no significantly greater frequency or severity of asthma outcomes in children exposed to tobacco smoke. Household smoke exposure was only significantly associated with inhaler use. Oddly, asthmatic children living in smoking households were highly unlikely to have used an inhaler in the past month (Odds Ratio = 0.493, p = 0.0406). Tobacco smoke exposure was associated with higher odds of wheezing attacks, but lower odds of ER visit (though neither was significant). **CONCLUSION:** Despite results, opportunities to improve asthma outcomes exist. In the sample, children in smoking households were more likely to be African American, female, live below the poverty level, and be exposed to other indoor pollutants that trigger asthma exacerbations. Initiatives targeted to this group may improve asthma outcomes through education on reduction/elimination of unnecessary indoor allergens. Study limitations include small sample size, potential recall bias due to self or parental-report, lack of data related to family smoking and asthma history and other exposures, and time variation in data collection.

## RESPIRATORY-RELATED DISORDERS—Cost Studies

**PRS6**

### A COST-EFFECTIVENESS MODEL FOR SMOKING CESSATION THERAPY USING VARENICLINE

Viswanathan S, Neville W, Patel E, Raparla S, McGhan WF
University of the Sciences in Philadelphia, Philadelphia, PA, USA

**OBJECTIVE:** Smoking, a leading cause of morbidity and mortality in the US, results in approximately 440,000 deaths, economic costs of $96.8 billion, and losses of more than 5.6 million years of potential life each year. The aim of this study was to compare the costs and effectiveness of the new drug varenicline

against the existing therapy buproprion SR. **METHODS:** A decision analytic model was developed using DATA Treeage software to compare the cost-effectiveness of varenicline with buproprion SR. The costs and probabilities of success were reported for 12 weeks for 1 mg varenicline and 150 mg buproprion SR. The drug acquisition costs were obtained from the Drug Topics Red Book and published clinical trials. The model also included costs and effectiveness values for placebo. Costs for physician visits and counseling were obtained from clinical trials and other published sources. The probabilities of success were reported as the continuous abstinence rate (CAR) in all the studies. Treatment effects were compared using head-to-head clinical trials. Incremental cost effectiveness ratios (ICERs) were calculated for additional cost/CAR and were estimated relative to placebo. One- way sensitivity analysis was performed to determine the robustness of the results. **RESULTS:** The ICER for varenicline compared to placebo was $3688/CAR, and the ICER for buproprion SR compared to placebo was $5915/CAR. The total costs of varenicline and buproprion SR were $1696.2 and $1833.6 respectively. Varenicline was found to be more effective than buproprion SR and placebo with a CAR of 0.46, compared to CARs of 0.31 and 0.17 respectively. Sensitivity analysis indicated that the results were affected by the model assumptions for cost and effectiveness treatment options. **CONCLUSION:** Based on the results from the decision analytic model, smoking cessation therapy with varenicline should result in lower costs, and higher CARs as compared to buproprion SR.

**PRS7**

### COST-EFFECTIVENESS OF CICLESONIDE VERSUS FLUTICASONE IN THE TREATMENT OF PATIENTS WITH MILD, MODERATE, AND SEVERE ASTHMA

Taylor DC[1], DeLong K[1], Nunes K[1], Seal B[2]
[1]i3 Innovus, Medford, MA, USA, [2]Sanofi-Aventis, Bridgewater, NJ, USA

**OBJECTIVE:** The objective of this study was to assess the cost-effectiveness of ciclesonide versus fluticasone in adult patients with mild, moderate, and severe asthma. **METHODS:** A decision tree model was developed to simulate the health consequences and costs associated with daily asthma medication use. Patients were assumed to receive either ciclesonide or fluticasone. Potential health consequences for patients in the model included an adverse drug event (ADE) and symptom-free (SF) day. Costs included those associated with drug acquisition, the use of rescue medication, and medical resource utilization due to ADEs or non-SF days. The efficacy of ciclesonide and fluticasone was estimated using data from multiple clinical trials and data on file at Sanofi-Aventis. Data on medical resource utilization following ADEs and costs were estimated from published literature. Parity in the cost of ciclesonide and fluticasone was assumed. The model was used to calculate total daily costs, probability of an ADE-free (ADEF)/SF day, and the incremental cost per ADEF/SF day for ciclesonide versus fluticasone. **RESULTS:** The use of ciclesonide is associated with lower costs ($2.01 vs. $2.02) and higher probability of an ADEF/SF day (0.254 vs. 0.247) than fluticasone, indicating that ciclesonide dominates fluticasone in the treatment of patients with varying asthma severity. Results of a one-way sensitivity analysis of all model parameters suggest that the model is most sensitive to changes in the probability of a symptom-free day on treatment with fluticasone. A two-fold increase in the cost of ciclesonide yields an ICER of $88.38 per ADEF/SF day. **CONCLUSION:** Ciclesonide produces more ADEF/SF days than fluticasone and therefore dominates fluticasone when drug prices are equal.

**PRS8**

### HEALTH ECONOMICS OF ASTHMA: ASSESSING THE VALUE OF ASTHMA INTERVENTIONS

Spackman DE, Campbell JD, Sullivan SD
University of Washington, Seattle, WA, USA

**OBJECTIVE:** We undertook a systematic review of asthma intervention health economic studies from 2002 through 2007, evaluated how well the current health economic recommendations in asthma have been followed, assessed the implications of health economics research by comparing findings to coverage and reimbursement patterns and, suggested avenues for future improvement. **METHODS:** We performed a state-of-the-art review using multiple search databases. We used past health economic asthma reviews to assess whether current studies have complied with previous recommendations. We compared the pharmaceutical value-for-money conclusions with their formulary coverage from a large payer in the US and the British reimbursement recommendations. **RESULTS:** We included 39 of the 176 studies that met our initial criteria. Data sources used to inform the economic analyses ranged in duration from 12 weeks (8) to three years (2). Uncertainty was reported by 19 studies. The most common benefit outcome was symptom free days (14). Seven studies reported quality-adjusted life years. Thirty-four of 39 reported that the intervention of interest was cost-effective or dominant. **CONCLUSION:** Previous recommendations for longer-term pragmatic trials are still germane. Using the Global Initiative for Asthma guidelines, the reviewed pharmaceutical interventions assumed relevant comparators but few studies compared combination products to their collective components. Care should be taken in the interpretation of incremental cost-effectiveness ratios that use asthma specific event avoided outcomes because these outcomes may not capture the complete effects of treatment and may be biased due to double counting. We recommend the use of generic measures sensitive to asthma patients and standardized across diseases. Willingness-to-pay must be assumed to conclude cost-effectiveness and must be justified. The overall findings from this health technology assessment review are consistent with the coverage and reimbursement recommendations in the UK (British Thoracic Society and Scottish Intercollegiate Guidelines Network) and US (Aetna's 2007 preferred drug guide).

**PRS9**

### THE COST-EFFECTIVENESS OF TARGETED PRESCRIBING OF ANTIMICROBIALS IN CANADA FOR COMMUNITY-ACQUIRED PNEUMONIA IN AN ERA OF ANTIMICROBIAL RESISTANCE

Moore L[1], Martin M[1], Quilici S[1], Low DE[2], Grossman R[3], Kureishi A[4], Kubin M[5], Jaszewski B[6], Rebeira M[6]
[1]i3 Innovus, Uxbridge, Middlesex, UK, [2]Mount Sinai Hospital, Toronto, ON, Canada, [3]Credit Valley Hospital, Mississauga, ON, Canada, [4]Bayer HealthCare, Singapore, Singapore, [5]Bayer Healthcare AG, Wuppertal, Germany, [6]Bayer Healthcare, Toronto, ON, Canada

**OBJECTIVE:** To assess the cost-effectiveness of empirical outpatient treatment options in Canada for community-acquired pneumonia (CAP) in the presence of antimicrobial resistance. **METHODS:** A multi-country decision analytic model to assess the clinical and economic consequences of antimicrobial resistance, developed for mild-to-moderate empirical CAP outpatient treatment, was adapted to Canada. Treatment algorithms involved first- and second-line treatment in the community, and incorporated follow-up after treatment failure due to resistance or other reasons and resulting hospitalizations. Comparators included (1) first-line treatment with azithromycin, a generic macrolide prescribed in Canada, followed by moxifloxacin, a fluoroquinolone, and (2) first-line treatment with moxifloxacin followed by azithromycin upon failure. Clinical failure rates with