MO4
ECONOMIC EVALUATION OF TREATMENT STRATEGIES FOR LATE-PRESENTATION ACUTE ISCHEMIC STROKE
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OBJECTIVES: For late-presentation ischemic stroke patients, economic evidence comparing all currently employed treatment strategies is lacking. We conducted an economic evaluation comparing best medical treatment to intravenous thrombolysis, intra-arterial thrombolysis and mechanical thrombectomy for these patients. **METHODS:** A probabilistic economic model was designed from the perspective of a government payer to calculate the lifetime incremental costs and quality adjusted life years (QALYs) for each treatment compared to best medical treatment. Effectiveness data were extracted from randomized trials, where possible, and discharge disposition from Ontario stroke registries. Inpatient costs were taken from the Ontario Case Costing Initiative, professional fees from the Ontario Schedule of Benefits for Physician Services and other costs from an Ontario cost of stroke study. Costs were presented in 2011 Canadian dollars. **RESULTS:** Expected incremental QALYs over best medical treatment were 0.02, 0.16 and 0.27 for intravenous thrombolysis, intra-arterial thrombolysis and mechanical thrombectomy, respectively, while the expected incremental costs were $1,986; $4,336 and $4,058, respectively. Expected incremental QALYs and costs showed that both intravenous thrombolysis and intra-arterial thrombolysis were extendedly dominated. Mechanical thrombectomy had an incremental cost-effectiveness ratio of $14,790/QALY. At a willingness-to-pay threshold of $50,000/QALY, mechanical thrombectomy and intra-arterial thrombolysis had 70% and 30% likelihood of being cost-effective, respectively. Intravenous thrombolysis had the lowest probability of being cost-effective across all willingness-to-pay thresholds ($0-$200,000/QALY). **CONCLUSIONS:** Intravenous thrombolysis in late-presentation stroke patients may not be a cost-effective treatment strategy. Endovascular approaches such as intra-arterial thrombolysis and especially mechanical thrombectomy may lead to an economic benefit, though more evidence is needed to reduce considerable decision uncertainty.

PODIUM SESSION III:
HEALTH CARE POLICIES & EXPENDITURES

HC1
DID MASSACHUSETTS HEALTH REFORM LOWER HOSPITAL INPATIENT COST?
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OBJECTIVES: This paper estimates the impact of Massachusetts healthcare reform on the cost of inpatient visits by employing several methodological approaches using panel data. **METHODS:** The Healthcare Cost and Utilization Project (HCUP) 2005-2009 State Inpatient Databases (SID) for Massachusetts were used in this analysis. The SID provide detailed diagnoses and procedures, total charges and patient demographics. Our key covariate of interest is MA enrollment and the total costs associated with each hospital visit. To obtain costs, we applied hospital specific HCUP cost-to-charge ratios. We adjusted these costs with the CMS area wage index. We obtained information about hospital characteristics using the American Hospital Association Annual Survey Database; and county level information from the Area Resource File. We develop a baseline cost model with risk-adjustments to estimate the impact of Massachusetts health reform on the total costs of inpatient visits. Our methodological approach controls for patients heterogeneity, and reduces biases resulting from aggregation over patients over time. To assess the robustness of our baseline results, we conducted several empirical estimations and tested their significance. First, we estimated the baseline cost model with pooled ordinary linear regressions (OLS). Next, we estimated the baseline cost model with random effect panel regression. We performed the Lagrange Multiplier (Breusch and Pagan 1980) test and found that random effect panel data estimates are favored over pooled OLS estimates. Next, we estimated our baseline cost model with a fixed-effect panel regression. We also performed the Hausman specification test (Hausman 1978), which indicated that the fixed effect model was appropriate compared to random effect model. **RESULTS:** Our estimates show that Massachusetts health reform decreased the hospital inpatient cost per visit at least by $120 when individual heterogeneity and risk-adjustments were controlled. **CONCLUSIONS:** We found that Massachusetts health reform decreased the average cost of the hospital inpatient visits.

HC2
ASSOCIATION OF ALLERGIC RHINITIS WITH ASTHMA EXACERBATIONS AND HEALTH CARE COSTS IN ASTHMA PATIENTS
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OBJECTIVES: To evaluate the association of allergic rhinitis (AR) with asthma exacerbations and healthcare costs of asthma patients. **METHODS:** Newly diagnosed patients 12-64 years of age with ≥2 asthma diagnoses, or 1 diagnosis and ≥1 asthma-related prescription claim, during the period 1/1/2008-3/31/2011, continuously eligible for 12 months before and 24 months after index asthma diagnosis were identified from a privately-insured claims database (N~14,000,000). The index date was defined as the date one year after the index asthma diagnosis, baseline period as 12 months before, and study period as 12 months after the index date. Two cohorts were selected from the sample: asthma-only (without any AR diagnosis); and asthma+AR (with ≥1 AR diagnosis and ≥1 intranasal corticosteroid claim during baseline). Descriptive analyses compared demographic characteristics, co-morbidities, healthcare costs (medical service and prescription drug costs) inflated to 2010 dollars, and asthma exacerbations (defined as either an inpatient or emergency department visit with asthma diagnosis or use of oral corticosteroid). Multivariate analyses adjusting for baseline differences were used to estimate risk-adjusted asthma exacerbations and costs. **RESULTS:** Asthma+AR patients(n=3,716) had similar mean age and gender distribution but higher proportions of comorbidities(e.g., sinusitis, sleep apnea) compared with asthma-only patients(n=8,547). During the study period, asthma+AR patients had significantly higher proportion of asthma exacerbations(29.5% vs. 20.6%, p<.0001), possibly due to higher oral corticosteroid use(27.8% vs. 18.5%, p<.0001), and higher mean number of asthma-related outpatient/other visits(7.1 vs. 3.4, p<.0001). Asthma+AR patients had significantly higher healthcare costs($6,833 vs. $6,137, p<.0001), due to higher drug costs($2,136 vs. $1,396, p<.0001), higher asthma-related costs($744 vs. $439, p<.0001), and higher asthma-related drug costs($492 vs. $250, p<.0001), than asthma-only patients. Risk-adjusted asthma exacerbations and costs were also higher for asthma+AR patients. **CONCLUSIONS:** In this analysis, patients with asthma+AR had significantly higher proportion of asthma-related exacerbations and higher healthcare costs compared with asthma-only patients.

HC3
ASSESSING THE VALUE OF BIOPHARMACEUTICALS: COST-EFFECTIVE INNOVATIONS OR INEFFICIENT USE OF RESOURCES?
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OBJECTIVES: Greater market availability and high per unit costs make biopharmaceuticals one of the fastest growing areas of health care spending. As a result, policymakers are increasingly questioning whether they provide value for money. The purpose of this study was to examine the cost-utility literature to compare the value of biopharmaceuticals with conventional pharmaceutical and non-pharmaceutical interventions. **METHODS:** The Tufts Medical Center Cost-Effectiveness Analysis Registry (www.cearegistry.org), which contains detailed information on over 2300 cost-utility analyses (CUAs), was used for the analysis. Articles for biopharmaceuticals were identified using the Biotechnology Database from the Tufts Center for the Study of Drug Development. The characteristics and study quality of all articles published between 1976 and 2009 were compared across the three categories of interventions. The distribution of cost-utility ratios, weighted by the number of published ratios in the article, for each intervention category and selected diseases studied were also compared. **RESULTS:** Studies of biopharmaceuticals comprised 11% of the 2383 studies included in the Registry, making them the sixth largest category. Overall characteristics of biopharmaceutical articles were similar to other CUAs, yet they had slightly better methodological quality. The weighted median ratio for biopharmaceuticals ($15,412) was less favorable (i.e., higher) than those of conventional pharmaceuticals ($7,095) and most other types of health interventions ($9,284). Ratios for biopharmaceutical cancer, rheumatologic, and neurological therapies were also significantly more likely to be greater than the overall median of $9041 as compared with other interventions. Despite these results, the wide range of biopharmaceutical ratios suggests many nevertheless provide value for money. **CONCLUSIONS:** Biopharmaceuticals occupy a small yet increasing role in the cost-utility literature. While, in aggregate, they are less favorable than most other types of treatments for a number of diseases, the data suggest that many individual biopharmaceutical therapies are cost-effective.

HC4
CMS'S USE OF COST-EFFECTIVENESS EVIDENCE IN NCDS FOR PREVENTION
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OBJECTIVES: The U.S. Centers for Medicare and Medicaid Service's (CMS's) stated policy is that it does not use cost-effectiveness evidence in National Coverage Determinations (NCDs). This position appeared to be reinforced in the recent U.S. Patient Protection and Affordable Care Act (PPACA) which, while not explicitly prohibiting the use of cost-effectiveness evidence, barred the use of cost-per QALY thresholds in coverage decisions. The objective of this study is to review CMS NCDs made since the enactment of PPACA (March 23, 2010) to determine whether and how CMS has used cost-effectiveness evidence in its decision-making. **METHODS:** We reviewed the decision memorandum for each NCD from March 23, 2010, through December 2011. We documented any mention of cost-effectiveness evidence. On occasions when cost-effectiveness evidence was used or cited in CMS's review, we reviewed the decision memorandum to identify the legislative authority cited. **RESULTS:** Since March 23, 2010, CMS have made 18 NCDs. Cost-effectiveness evidence was used only in the 4 of the 18 NCDs pertaining to preventative care (i.e., in the 14 NCDs pertaining to non-preventative care, cost-effectiveness was not mentioned). In two instances, cost-utility studies (reporting cost-per QALY ratios) featured in CMS's review. In the remaining two instances, cost-effectiveness was reported using "cost-per additional depression free day" and "cost-per case treated". A cost-per QALY threshold was not discussed in any decision memo. In each instance, the legislative authority used for the inclusion of cost-effectiveness evidence was the Medicare Improvement for Patients and Providers Act (MIPPA) of 2008 (which grants CMS authority to "*conduct an assessment of the relation between predicted outcomes and the expenditures.*") **CONCLUSIONS:** The findings suggest that CMS is routinely considering cost-effectiveness evidence in NCDs for preventative care. Consistent with the PPACA legislation, a cost-per QALY threshold was not used.