Medicaid Services fee schedules (Medicare fee), National Fee Analyzer (commercial fee), and Healthcare Cost and Utilization Project, respectively. Dosage, AE rates, and monitoring assumptions were based on clinical trial publications and prescribing information. Costs per patient per year (PPPY) were estimated. ***Results:*** The estimated total costs PPPY were $163,755 (zanubrutinib), $175,570 (acalabrutinib), and $185,947 (ibrutinib) for a Medicare plan; and $166,818 (zanubrutinib), $178,614 (acalabrutinib), and $189,011 (ibrutinib) for a commercial plan. The pharmacy costs PPPY were $157,484 (zanubrutinib), $171,229 (acalabrutinib), and $180,414 (ibrutinib), which accounted for more than 94% of the total costs for both plans. A small proportion of the total costs was related to AE, mainly for the management of neutropenia and pneumonia. ***Conclusions:*** Zanubrutinib was associated with a PPPY cost saving in comparison with other BTKi, acalabrutinib and ibrutinib, among adults with MCL who have received at least 1 prior therapy from the US payer perspectives. The saving was primarily driven by lower drug acquisition cost with zanubrutinib. In addition to treatment cost, decision makers should also consider efficacy and tolerabiltiy of BTKi in treatment selection.

## PCN81
## END-OF-LIFE COSTS FOR SELECTED SOLID CANCERS: AN ANALYSIS OF MEDICARE CLAIMS DATA

**Sussman M,** Benner J, Watzker A, Garman A, Menzin J
*Boston Health Economics, LLC, Boston, MA, USA*

***Objectives:*** Economic models of novel cancer treatments rarely use real-world data to estimate end-of-life (EOL) costs. Obtaining improved estimates may lead to important cost offsets for novel interventions that delay progression, or are curative, and extend life. This study assessed total direct medical costs in the 6 months before death (MBD) for patients diagnosed with breast cancer (BC), prostate cancer (PC), or lung cancer (LC). ***Methods:*** This retrospective cohort study used Medicare 5% data between 04/01/2012 and 03/31/2016. Patients with BC, PC, or LC were placed into cohorts and were identified based on: (1) evidence of death between 04/01/2013 and 03/31/2016, (2) ≥1 encounter with a diagnosis of BC, PC, or LC in any setting in the 6 MBD, (3) age ≥65 years on the date of death, (4) continuous enrollment in Medicare with medical and hospital benefits in the 6 MBD, and (5) no days of commercial enrollment. Outcome measures included mean all-cause direct medical costs (Medicare amount paid), overall and by setting of care (inpatient hospital, skilled nursing facility [SNF], hospice, home health [HH], other settings), in the 6 MBD. ***Results:*** Among BC patients, the mean (SD) all-cause direct medical costs in the 6 MBD were $39,963 ($38,564). For LC and PC, mean (SD) costs in the 6 MBD totaled $41,618 ($38,074) and $42,603 ($42,543), respectively. Of the total direct medical costs, more than half of the costs across each cohort (58-61%) were attributable to inpatient hospitalizations. Other settings, SNF, hospice, and HH costs amounted to 13-17%, 9-13%, 8-10%, and 4-6% of total costs, respectively, across the cohorts. ***Conclusions:*** Patients diagnosed with solid tumor cancers face significant burden with respect to EOL costs which should be incorporated in economic models to estimate the value and potential cost offsets of novel therapies.

## PCN82
## BURDEN OF HOSPITALIZATIONS IN MULTIPLE MYELOMA WITH AND WITHOUT HEMATOPOIETIC STEM CELL TRANSPLANT: A PROPENSITY SCORE MATCHED ANALYSIS OF IN-PATIENT CLAIMS DATABASE

**Aggarwal S,**[1] Bela A,[2] Topaloglu O[2]
[1]*NOVEL Health Strategies, Bethesda, MD, USA,* [2]*NOVEL Health Strategies, Chevy Chase, MD, USA*

***Objectives:*** To examine trends in hospital length of stay and total costs in MM patients with and without Hematopoietic Stem Cell Transplant (HSCT). ***Methods:*** The latest available 2016 National Inpatient Sample (NIS) data set from the Healthcare Cost and Utilization Project was utilized in order to determine the number of hospital admissions for patients with MM. Propensity score matched analysis was conducted to compare hospital LOS and costs in MM patients with and without HSCT. Thirty comorbidities were assessed using Elixhauser scoring. Multivariate logistic regression was conducted to assess predictor variables for LOS and costs. ***Results:*** In 2016, there were an estimated 108,170 hospitalizations with a diagnosis of MM, of which 4480 also had a procedure code for HSCT. The mean age was 60.6 (SD 8.6) and 69.8 (SD 11.6) in MM patients with and without HSCT, respectively. 45.7% and 45.0% were female in MM with and without HSCT, respectively. Most common comorbidities (more than 10%) were congestive heart failure (23.7%), cardiac arrhythmias (28.3%), hypertension (35.1%), chronic pulmonary disease (19.7%), diabetes (14.3% uncomplicated, 13.4% complicated), renal failure (39.9%), coagulopathy (19.7%) and depression (12.7%). The propensity score matched hospital LOS was 16.9 and 6.7, with a statistically significant difference of 10.2 days (SE 0.25, $P<0.05$), in MM patients with and without HSCT. The propensity score matched hospital charges were $196,457 and $69,903, with a statistically significant difference of $126,553 (SE $3617, $P<0.05$), in MM patients with and without HSCT. Predictor variables for hospital LOS and costs were HSCT, weight loss, cardiac arrhythmias and coagulopathy. ***Conclusions:*** MM patients with HSCT incur significantly longer hospital length of stay and nearly 3 times the costs compared to patients without HSCT. There is a need for better treatment management for patients with MM undergoing HSCT.

## PCN84
## BUDGET IMPACT ANALYSIS OF AYVAKIT (AVAPRITINIB) IN PATIENTS WITH GASTROINTESTINAL STROMAL TUMORS AND A PDGFRA EXON 18 MUTATION

**Proudman D,**[1] Miller A,[1] Nellesen D,[1] Gomes A,[1] Mankoski R,[2] Norregaard C,[2] Sullivan E[2]
[1]*Analysis Group, Inc., Menlo Park, CA, USA,* [2]*Blueprint Medicines Corporation, Cambridge, MA, USA*

***Objectives:*** To estimate the budget impact, from the perspective of a one-million member US health plan, of using avapritinib to treat adult patients with unresectable or metastatic GIST with a *PDGFRA* exon 18 mutation, including a D842V mutation. ***Methods:*** A budget impact model with a 3-year time horizon was developed in Microsoft Excel. The model included costs for drug acquisition, molecular testing, treatment monitoring, adverse events, and up to two subsequent lines of drug treatment following disease progression. The number of treated patients was based on age and gender-adjusted incidence of metastatic GIST, and a *PDGFRA* exon 18 mutation rate of 1.9%. Duration of treatment reflected median progression free survival from clinical trial data. The model assumed the introduction of avapritinib would increase *PDGFRA* molecular testing rates from the current rate of 49% to 69%. Base case assumptions also included a mixed 69% commercial, 22% Medicare, and 9% Medicaid population. ***Results:*** Less than 0.1 new *PDGFRA* exon 18 patient per-year is estimated to be eligible for treatment. With avapritinib available, the average total incremental annual plan costs in years one, two, and three are $10,991, $27,992, and $46,994, respectively (per-member per-month $0.001, $0.002, and $0.004, respectively). These values include cost offsets of $577, $2,102, and $3,709 in avoided or delayed post-progression costs in years one, two, and three, respectively. In addition, the increased rates of molecular testing resulted in an incremental health plan testing cost of $453 in year three of avapritinib availability. ***Conclusions:*** The model results suggest that the use of avapritinib to treat patients with unresectable or metastatic GIST with a *PDGFRA* exon 18 mutation would result in a minimal budget impact to a US health plan, due to the small patient population and cost savings from reduced post-progression costs.

## PCN85
## COST-EFFECTIVENESS OF OLAPARIB AS A MAINTENANCE TREATMENT OPTION FOR NEWLY DIAGNOSED BRCA-MUTATED OVARIAN CANCER WHO ARE IN RESPONSE AFTER FIRST-LINE PLATINUM-BASED CHEMOTHERAPY IN PANAMA

**Castillo-Fernandez O,**[1] Murtiera S,[2] Solorzano J,[2] Martin C,[1] Amador Sosa JL,[1] Lim Law M,[1] Véliz Centella I,[1] Cercone J,[3] Leon A[4]
[1]*Instituto Oncologico Nacional, Panama, Panama,* [2]*AstraZeneca CAMCAR MAC, San José, Costa Rica,* [3]*Sanigest Internacional, San Jose, Costa Rica,* [4]*Sanigest Internacional, San Jose, FL, Costa Rica*

***Objectives:*** SOLO1 was an international, Phase III, randomised, double-blind, placebo-controlled trial that assessed the efficacy and safety of olaparib (OLA) versus placebo in patients with newly diagnosed advanced BRCA-mutated ovarian cancer who were in response (complete or partial) following first-line platinum-based chemotherapy. The acquisition cost of new oncology drugs is a concern for payors in emerging markets. This study aimed to evaluate the cost-effectiveness of OLA therapy in this new indication versus routine surveillance (RS) in the Panamian population, using national estimates of costs and treatment patterns. ***Methods:*** A three-state partitioned survival model was developed to simulate the lifetime (50 years) incremental cost-effectiveness ratio (ICER) of OLA versus RS from a payer perspective. Progression-free survival (PFS) and overall survival (OS) curves were estimated using data from SOLO1 and extrapolated using parametric survival models for Panama. Mortality and morbidity rates for the groups were modelled based on assumptions validated with local clinicians. Health state utilities and adverse event frequencies were obtained from SOLO1 study. Drug costs were provided by the Panamian Institute of Oncology (ION). Healthcare resource usage and costs were based on local clinician input and local publications. A 1.5% discount rate was applied to costs and outcomes. ***Results:*** Maintenance treatment with OLA in first line setting after platinum based chemotherapy compared to routine surveillance as currently practiced was associated with an ICER of $ $35,512 per QALY. This ICER is lower than the WHO-WTP threshold of three times GDP per capita of $$48,736 and the willingness-to-pay (WTP) analysis showed an estimated 100% probability to be cost-effective. The results were robust to univariate sensitivity analysis, with all variables having a non-significant impact. ***Conclusions:*** OLA is a cost-effective treatment option for patients with newly diagnosed BRCA-mutated ovarian cancer, who are in response (complete or partial) after first-line platinum-based chemotherapy in Panama.

## PCN86
## HOSPITAL SHARE OF PROFITS FROM PHYSICIAN-ADMINISTERED MEDICINES

**Ortendahl J,** Bognar K
*Partnership for Health Analytic Research, LLC, Beverly Hills, CA, USA*

***Objectives:*** Providers (both physicians and hospitals) retain a portion of spending on medicines in the form of markups when administering injectable and infused drugs. In this analysis, we aimed to estimate the amount retained by providers, and the share retained by hospitals compared with physicians, both within all medicines and

when focusing on oncology drugs. ***Methods:*** We developed a Microsoft Excel based model to estimate markups received by hospitals and physician offices from any physician administered drugs as well as from oncology drugs only, for commercially insured patients in 2017. Total provider surplus on medical pharmacy as well as profit margin for hospital and physician offices were obtained from published literature. Site of service mix between physician office and hospital outpatient department was estimated by share of reimbursement whenever available and by share of utilization otherwise, with data obtained from an industry report developed by Magellan. ***Results:*** In 2017, $30 billion of commercial medical pharmacy spending was retained by providers in the form of markups. Of this total, we estimated that $27.3 billion (91%) were received by hospitals while the remaining $2.7 billion (9%) went to physician offices, despite only 53% of patients being treated in the hospital setting. When focusing on oncology drugs, we estimated that $8.9 billion (87%) and $1.3 billion (13%) in commercial medical pharmacy spending were received by hospital outpatient departments and physician offices, respectively, due to markups on physician-administered medicines. ***Conclusions:*** In the commercial market, hospitals retain a disproportionately large share of the gross profit relative to physicians, and a substantial amount of total spending within both all physician-administered medicines and within oncology physician-administered medicines. Further efforts to consider all parties along the supply chain should be made when trying to address health care spending in the U.S.

## PCN87
## COST-EFFECTIVENESS OF RIBOCILIB PLUS NONSTEROIDAL AROMATASE INHIBITOR (NSAI) IN HORMONE RECEPTOR–POSITIVE, HUMAN EPIDERMAL GROWTH FACTOR RECEPTOR 2–NEGATIVE (HR+/HER2-) ADVANCED BREAST CANCER (ABC): A CANADIAN HEALTHCARE PERSPECTIVE

**Stellato D,**[1] Thabane M,[2] Chandiwana D,[3] Lanoue B,[3] Delea TE[4]
[1]*Policy Analysis Inc. (PAI), Brookline, MA, USA,* [2]*Novartis Oncology, Mississauga, ON, Canada,* [3]*Novartis Pharmaceuticals Corporation, East Hanover, NJ, USA,* [4]*Policy Analysis Inc., Brookline, MA, USA*

***Objectives:*** The MONALEESA-7 trial demonstrated the efficacy and safety of ribociclib plus NSAI (R+NSAI) vs. placebo plus NSAI for pre-/peri-menopausal women with HR+/HER2- ABC who had received no prior endocrine therapy (ET) for advanced disease. This analysis evaluated the cost-effectiveness of R+NSAI vs. NSAI in this population from a Canadian healthcare payer perspective. ***Methods:*** The incremental cost-effectiveness ratio (ICER) expressed as incremental costs per quality-adjusted life-year (QALY) gained for R+NSAI versus NSAI, was estimated using a semi-Markov cohort model developed in Microsoft Excel with states for progression-free (PF), post-progression (PP), and dead. A 15-year time horizon was used. Survival distributions for PFS, PPS and time to discontinuation (TTD) were based on parametric survival distribution fit to data from MONALEESA-7. Health-state utilities were estimated using EQ-5D index values collected in MONALEESA-7. Direct costs of ABC treatment (medication and administration costs, follow-up and monitoring, adverse events, subsequent treatments) were based on Canadian specific values from published sources. Costs ($ CAN) and QALYs were discounted at 1.5% annually. ***Results:*** In the base case, R+NSAI was estimated to result in gains of 1.44 life years and 1.19 QALYs vs. NSAI, at an incremental cost of $210,767. The ICER of R+NSAI vs. NSAI was $177,245 per QALY gained based on deterministic analyses and $178,872 based on the mean of probabilistic analyses. Results were sensitive to parametric distributions used for projecting long-term TTD, PFS, and PPS. ***Conclusions:*** For pre-/peri-menopausal women with HR+/HER2- ABC who had received no prior ET for advanced disease, R+NSAI is projected to result in substantial gains in QALYs compared with NSAI. At its current list price, ribociclib used in combination with an NSAI is cost-effective in this population at an ICER threshold of approximately $177,245. These results may be useful in deliberations regarding reimbursement and access to this treatment.

## PCN88
## SIMPLIFIED APPROACH TO NON-DRUG COSTING IN EARLY COST EFFECTIVENESS MODELLING FOR NOVARTIS INTERVENTIONS IN ONCOLOGY

**Johns A,** Mahida S
*Novartis Oncology, East Hanover, NJ, USA*

***Objectives:*** Accurately assessing non-drug related costs for early-stage Cost Effectiveness (CE) models is complicated and there is a high degree of uncertainty about disease state and treatment patterns. To inform prioritization of cost categories and which of them are most important to accurately estimate in an early stage model, we examined previously completed Novartis models and assessed the impact of non-drug costs on the ICER result. ***Methods:*** Previously completed Novartis Oncology global CE models were collected for analysis. Models were categorized by therapeutic area (TA) (Breast cancer, Lung cancer, Leukemia, other solid tumor and other hematologic cancer). ICERs were recalculated between the Novartis compounds and all included comparators by setting non-therapy costs (Adverse Events (AEs), terminal care, pre- and post-progression treatment, and dispensing and administration) to zero, both by category and overall. Percentage ICER change from the base case was recorded and analyzed by TA and cost category. ***Results:*** This review included 15 CE models with 23 distinct comparisons. Percentage change from base case (and range) due to omitting pre-progression, post-progression, dispensing and administration, AE and terminal care costs was 4.66% (-6.78% to 30.43%), -2.13% (-39.25% to 16.83%), 3.07% (-1.76% to 33.48%), 0.49% (-13.38% to 5.54%) and -0.44% (-0.92% to 0.00%) respectively. By TA, Percentage change from base case ICER when omitting all non-drug costs was 11.20% for Breast Cancer, 6.70% for Lung Cancer, 2.38% for Leukemia, -11.16% for other solid tumor and -0.26% for other hematologic cancer miscellaneous. Omitting pre-progression and post-progression costs resulted in the greatest degree of variation from the model base case. ***Conclusions:*** This study helps quantify the impact of omitting non-drug costs when developing simplified early models and the range of potential variation from final ICERs which may be anticipated. Pre-progression and post-progression costs have the greatest impact on model results and should be prioritized for accurate assessment.

## PCN90
## ASSESSMENT OF UTILITIES FOR ADVERSE EVENTS (AES) ASSOCIATED WITH CHIMERIC ANTIGEN RECEPTOR (CAR) T-CELL THERAPY IN LARGE B-CELL LYMPHOMA (LBCL)

**Howell T,**[1] Matza L,[1] Jun MP,[2] Garcia J,[3] Powers A,[2] Maloney DG[4]
[1]*Evidera, Bethesda, MD, USA,* [2]*Bristol-Myers Squibb, Summit, NJ, USA,* [3]*Juno Therapeutics, a Bristol-Myers Squibb company, Seattle, WA, USA,* [4]*Fred Hutchinson Cancer Research Center, Seattle, WA, USA*

***Objectives:*** CAR T-cell therapy is a promising treatment for LBCL. Cost-utility analyses are needed to examine and compare the value of these therapies, and these models require health state utilities representing the key AEs associated with therapy, including cytokine release syndrome (CRS) and neurological events (NEs). This study estimated utilities for various severity levels of CRS and NEs associated with CAR T-cell therapy. ***Methods:*** We used time trade-off methodology—a widely used methodology for assessing preference-based health-related quality of life—to conduct interviews with general population participants in the United Kingdom (London and Edinburgh). Participants valued 6 health state vignettes that were drafted based on literature review and clinician input. The first health state represented LBCL treated with CAR T-cell therapy without AEs. The other 5 health states described CRS or NEs of varying severity following CAR T-cell therapy. The disutilities (i.e., utility decrease) associated with these AEs were calculated by subtracting the utility of the health state without AEs from those of the other health states. ***Results:*** Interviews were conducted with 218 participants (London, n=113; Edinburgh, n=105; 50% male; mean age, 49 years). The mean (standard deviation [SD]) utility for CAR T-cell therapy without AEs was 0.73 (0.30). Mean (SD) disutilities associated with CRS were −0.01 (0.04) for grade 1, −0.05 (0.09) for grade 2, and −0.23 (0.24) for grade 3/4. Mean (SD) disutilities associated with NEs were −0.04 (0.07) for grade 1/2 and −0.18 (0.22) for grade 3/4. ***Conclusions:*** More severe AEs were associated with greater disutilities. Because the AEs were added to health states valued with a 1-year time horizon, these disutilities can be applied as quality-adjusted life-year decrements in cost-utility analyses. The health state utilities estimated in this study would be useful in cost-effectiveness models of CAR T-cell therapy in patients with LBCL.

## PCN91
## END-OF-LIFE COSTS FOR SELECTED HEMATOLOGIC CANCERS: AN ANALYSIS OF MEDICARE CLAIMS DATA

**Sussman M,** Benner J, Watzker A, Garman A, Menzin J
*Boston Health Economics, LLC, Boston, MA, USA*

***Objectives:*** Economic models of novel cancer treatments rarely use real-world data to estimate end-of-life (EOL) costs. Obtaining improved estimates may lead to important cost offsets for novel interventions that delay progression, or are curative, and extend life. This study assessed total direct medical costs in the 6 months before death (MBD) for patients diagnosed with diffuse large B-cell lymphoma (DLBCL) or multiple myeloma (MM). ***Methods:*** This retrospective cohort study used Medicare 5% data between 04/01/2012 and 03/31/2016. Patients with DLBCL or MM were identified based on: (1) evidence of death between 04/01/2013 and 03/31/2016, (2) ≥1 encounter with a diagnosis of DLBCL or MM in any setting in the 6 MBD, (3) age ≥65 years on the date of death, (4) continuous enrollment in Medicare with medical and hospital benefits in the 6 MBD, and (5) no days of commercial enrollment. Outcome measures included mean total all-cause direct medical costs (Medicare amount paid), overall and by setting of care (inpatient hospital, skilled nursing facility [SNF], hospice, home health [HH], other settings) in the 6 MBD. ***Results:*** Among DLBCL patients, mean (SD) age was 78.6 (7.5) years. Mean (SD) all-cause direct medical costs in the 6 MBD totaled $66,083 ($56,442), of which 70.2%, 12.8%, 9.2%, 4.3%, and 3.5% were attributable to inpatient hospitalizations, other settings, SNFs, hospice, and HH, respectively. Similarly, among MM patients, mean (SD) age was 78.6 (7.7) years. Mean (SD) all-cause direct medical costs in the 6 MBD totaled $57,324 ($49,826), of which 66.2%, 15.0%, 9.9%, 4.9%, and 4.0% were attributable to inpatient hospitalizations, other settings, SNFs, hospice, and HH, respectively. ***Conclusions:*** Patients diagnosed with hematologic cancers face significant burden with respect to EOL costs which should be incorporated in economic models to estimate the value and potential cost offsets of novel therapies.