Poster Tour Guide Packet

ISPOR 2022

Poster Session:	**In-Person and Virtual Poster Session 3**
Tour Name:	**Student**
Tour Time:	Tuesday, May 17, 2022, 12:15 - 1:15 PM
Tour Area:	Area A, Prince George Exhibit Hall

Acceptance Code:	EE113
Abstract Title:	Comparing Partitioned Survival and State Transition Modeling Approaches: A Case Study of Osimertinib Versus Pemetrexed-Platinum
Presenting Author:	Byeong-Chan Oh

Abstract Body:

OBJECTIVES: This study aimed to compare the partitioned survival model (PSM) and two state transition models considering additional health states with heterogeneity. To provide an illustration of the impact on the results of life-year and quality-adjusted life-year (QALY), economic models for osimertinib and pemetrexed-platinum in EGFR-mutated advanced non-small cell lung cancer were developed.

METHODS: Three economic models were constructed using parametric curves fitted to patient-level data from the National Health Insurance Review and Assessment claims database from 2009 to 2020. Time-to-next treatment (TTNT) was used as a proxy for real-world progression-free survival. The PSM and 3-health state transition model consisted of three health states: progression-free, post-progression, and death. The 5-health state transition model had additional two health states (brain metastasis with original therapy, brain metastasis with subsequent therapy). Time-dependent transition probabilities were calculated in the state transition models. Sensitivity analysis was performed on whether to apply separate utility values to the brain metastasis states.

RESULTS: All models showed a good visual fit to the overall survival and TTNT data. Estimates of the incremental life-year of osimertinib versus pemetrexed-platinum over 7 years were 0.889 (PSM), 0.899 (3-health state transition model), and 0.910 (5-health state transition model). Estimates of the incremental QALY of osimertinib versus pemetrexed-platinum were 0.828 (PSM), 0.840 (3-health state transition model), and 0.843 (5-health state transition model). According to the sensitivity analysis, incremental QALY from the 5-health state transition model was 0.695 when lower utility values were applied to the brain metastasis states.

CONCLUSIONS: The three economic models showed similar results in life-year and QALY. However, there was a considerable difference when separate utility values were applied to the brain metastasis states. This study suggest that additional health states can be considered for the state transition model to reflect heterogeneity in health status.

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Tour Area:	Area A, Prince George Exhibit Hall

Acceptance Code:	SA12
Abstract Title:	Can We Predicting Trial Failure Among Older Adult-Specific Clinical Trials Using Trial-Level Factors?
Presenting Author:	Woojung Lee

Abstract Body:

Objectives: Conducting older adult-specific clinical trials can help overcome the lack of clinical evidence for older adults due to their underrepresentation in clinical trials. These trials can help examine potential treatment heterogeneity between older versus younger patients, however there is a risk of failure that trial sponsors should take into account before making funding decisions. We aimed to develop a machine learning model that predicts trial failure among older adult-specific clinical trials using trial-level factors.

Methods: We identified phase 2-4 interventional cancer clinical trials that ended between 2008 and 2019 and had the minimum age limit of 60 years old or older using Aggregate Analysis of ClinicalTrials.gov data. We defined trial failure as closed early for reasons other than interim results or toxicity or completed with a sample of less than 85% of the targeted size. Candidate predictors were identified from a literature review. We evaluated random forests, least absolute shrinkage and selection operator (LASSO), and Elastic Net to find the best model. Model fitting and testing were performed using 5-fold nested cross-validation, which was repeated 30 times to account for variance. We calculated the median AUROC for each model.

Results: Of 209 older adult-specific clinical trials, 87 (42%) were failed trials per the definition of trial failure. Based on the AUROC on the validation sample, the best performing model was a LASSO with eleven predictors (test AUC = 0.68; IQR = 0.68-0.70). The study location, the number of facilities, and life expectancy restriction were found to be important predictors across all models.

Conclusion: We developed a machine learning model that predicts the risk of trial failure among older adult-specific clinical trials in cancer. Trial sponsors can estimate the risk of trial failure to inform their funding decisions and make efficient use of their resources.

Poster Tour Guide Packet

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Tour Time:	Tuesday, May 17, 2022, 12:15 - 1:15 PM
Tour Area:	Area A, Prince George Exhibit Hall

Acceptance Code:	EE44
Abstract Title:	Cost-Effectiveness of Pembrolizumab in First-Line Treatment of PD-L1 Positive Persistent, Recurrent, or Metastatic Cervical Cancer
Presenting Author:	Justin Nedzesky

Abstract Body:

OBJECTIVES: Pembrolizumab was recently approved as part of a first-line treatment regimen for PD-L1 positive persistent, recurrent, or metastatic cervical cancer based on interim results from the KEYNOTE-826 trial. This analysis aims to estimate the cost-effectiveness of pembrolizumab when added to cisplatin and paclitaxel, with or without bevacizumab, in PD-L1 positive persistent, recurrent, or metastatic cervical cancer using a US third-party payer perspective.

METHODS: We used a 3-state partitioned-survival model (stable disease, progressive disease, and death) to assess the difference between the arms of the KEYNOTE-826 trial in lifetime QALYs and costs. To generate transition probabilities, we extracted OS and PFS from published KEYNOTE-826 Kaplan-Meier curves, estimated outcomes based on methods from Hoyle and Henley (2011), and assessed various curve fits for projection to lifetime time horizon. For base-case, loglogistic distribution was selected based on lowest Akaike information criterion (AIC). A scenario analysis was performed to simulate greater intervention efficacy by using lognormal distribution in the pembrolizumab arm. Cost of drugs, administration, and laboratory fees were sourced from the CMS Drug Payment Table, Physician Fee Schedule, and Laboratory Fee Schedule, respectively. Cost of adverse event management and health state utilities were sourced from published literature. A discount rate of 3% per year was applied for both costs and health outcomes. The ICER was calculated and expressed as USD per QALY gained.

RESULTS: Pembrolizumab was estimated to provide 0.63 additional QALYs at an incremental cost of $476,700 resulting in an ICER of $752,000/QALY. In scenario analysis, greater pembrolizumab efficacy yielded an ICER of $534,400/QALY.

CONCLUSIONS: Using a willingness-to-pay threshold of $150,000/QALY, pembrolizumab may not be cost-effective when added to cisplatin and paclitaxel, with or without bevacizumab, in PD-L1 positive persistent, recurrent, or metastatic cervical cancer from a US third-party payer perspective. Future research may assess a cure fraction scenario.

Poster Tour Guide Packet

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Acceptance Code:	EE277
Abstract Title:	Cost-Effectiveness Analysis of National Smoking Cessation Service Among Chronic Obstructive Pulmonary Disease (COPD) Patients in Thailand
Presenting Author:	Ratthanon Prasitwarachot

Abstract Body:

OBJECTIVES: Smoking cessation interventions lower the risks of serious health problems and mortality and save the health system money. The national, multidisciplinary smoking cessation clinics have been founded in Thailand since 2004; however, their cost-effectiveness for patients with Chronic Obstructive Pulmonary Disease (COPD) has never been formally evaluated. This study aimed to assess the cost-effectiveness of these multidisciplinary clinics compared to usual care among patients with COPD in Thailand from a societal perspective.

METHODS: We conducted a cost-utility analysis and developed a Markov model encompassing six-health states to simulate lifetime costs and quality-adjusted life years (QALYs) of each smoking cessation intervention over the patient lifetime. The model also included two sub-models for current and former smokers. We derived the effectiveness of the smoking cessation clinics from a multicenter, longitudinal study of smoking cessation services across Thailand. We sought the natural quit rate, transition probabilities, health utility and cost data from the published literature. All future costs and outcomes were discounted at an annual rate of 3%. A series of sensitivity analyses was performed.

RESULTS: Compared to usual care, the national, multidisciplinary smoking cessation clinics were associated with higher costs and improved QALYs, with an ICER of 46,623.37 THB/QALY (1,469.19 US$/QALY). The efficacy of the national smoking cessation services was a key driver of the cost-effectiveness results. Results from the probabilistic sensitivity analysis showed the probability that the clinics are cost-effective at a willingness-to-pay (WTP) threshold of 160,000 THB (50,41.91 US$) was 97.7%.

CONCLUSIONS: The national, multidisciplinary smoking cessation clinics were cost-effective at the Thai WTP threshold of 160,000 THB/QALY due to their ability to reduce future smoking-related morbidity and mortality among COPD patients. Our results could assist health policy decision-makers in allocating resources to support smoking cessation services in Thailand.

Poster Tour Guide Packet

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Tour Area:	Area A, Prince George Exhibit Hall

Acceptance Code:	EE342
Abstract Title:	Compression Therapy with Early Endovenous Ablation in Venous Leg Ulceration in the U.S.: A Cost-Effectiveness Analysis
Presenting Author:	Hanke Zheng

Abstract Body:

Objectives: To analyze the cost-effectiveness of early endovenous ablation of superficial venous reflux in patients with venous leg ulcer (VLU) over 65 from a U.S. payer perspective.

Methods: A Markov model was constructed to simulate the progression of VLU for patients receiving compression therapy with early ablation vs. deferred ablation over 3 years from the U.S. payer perspective. The early intervention group receives compression therapy with endovenous ablation performed within two weeks. Patients receiving deferred ablation would have compression therapy alone, and defer the ablation until the ulcer heals, or after 6 months if the ulcer does not heal. The model inputs were sourced from the Early Venous Reflux Ablation trial, published literature, and data from U.S. Medicare. We considered probability of healing, probability of recurrence, direct medical costs, and quality-adjusted life years (QALY) impacted by VLU. We calculated the incremental net monetary benefit (NMB) at a willingness-to-pay threshold of $100,000/QALY. Univariate and probabilistic sensitivity analyses tested model uncertainty.

Results: Early ablation was a dominant strategy at a per-patient cost of $12,527 and 2.01 QALYs gained, whereas compression therapy with deferred ablation resulted in $15,208 and 1.98 QALYs gained per patient. At $100,000/QALY, the incremental NMB was $5,226 per-patient. Probability of healing, followed by the probability of recurrence, were the parameters with greatest impact on model uncertainty. The probabilistic sensitivity analysis showed that early ablation was cost-effective in 59.2% simulations at a threshold $100,000/QALY.

Conclusions: Compression therapy with early endovenous ablation was the dominating strategy as it was cost-saving while generating greater QALYs over a 3-year time horizon from the U.S. payer perspective. Payers should consider prioritizing early ablation on their formulary to prevent VLU complications rather than treat a costly outcome that also reduces patient health-related quality of life.

Poster Tour Guide Packet

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Tour Time:	Tuesday, May 17, 2022, 12:15 - 1:15 PM
Tour Area:	Area A, Prince George Exhibit Hall

Acceptance Code:	EE311
Abstract Title:	Cost-Effectiveness Analysis of Ruxolitinib vs Best Available Therapy for the Treatment of Myelofibrosis in the United States
Presenting Author:	Allen Smith

Abstract Body:

OBJECTIVES: Ruxolitinib is a targeted therapy approved for the treatment of intermediate and high-risk myelofibrosis that has been shown to improve survival and quality-of-life. The aim of this study was to assess the cost-effectiveness of ruxolitinib versus the best available therapy (BAT).

METHODS: COMFORT-II trial data was used to compare the survival of ruxolitinib versus BAT treatment. A Markov model with three health states (on-treatment, off-treatment, dead) was created for a ruxolitinib treatment and BAT arm using TreeAge Pro. A U.S. healthcare perspective was adopted with a willingness-to-pay (WTP) threshold of $150,000/QALY. A lifetime horizon of 15 years was used with a 28-day cycle length with costs and utilities discounted by 3%. Data on treatment discontinuation for ruxolitinib and BAT were estimated by calibrating a Gompertz distribution to the proportion of COMFORT-II patients who discontinued treatment at the 3 and 5-year time points and wide ranges were used in the on-to-off treatment transition probabilities in sensitivity analyses. Utility weights derived from a standard gamble approach were adopted for the model and direct medical costs were synthesized from the literature and updated to 2021 USD using the consumer price index medical component. One-way sensitivity analyses and probabilistic sensitivity analyses (PSA) were conducted.

RESULTS: Ruxolitinib treatment was expected to generate 4.71 QALYs at a cost of $1,107,203 while BAT was expected to generate 1.85 QALYs at a cost of $426,355 resulting in an incremental cost effectiveness ratio (ICER) of $238,474/QALY. None of the one-way sensitivity analyses resulted in an ICER < $150,000/QALY and the PSA revealed that ruxolitinib had an ICER < $150,000/QALY in 0.7% of iterations.

CONCLUSIONS: This analysis found that ruxolitinib may extend quality adjusted survival by almost three years but at current prices is unlikely to be a cost-effective option to treat myelofibrosis compared to BAT in the U.S.